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# Healthy communities equal healthy ecosystems? Evolution (and breakdown) of a participatory ecological research project towards a community natural resource management process, San Miguel Chimalapa (Mexico)

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**Healthy communities equal healthy ecosystems?  
Evolution (and breakdown) of a participatory ecological research project  
towards a community natural resource management process,  
San Miguel Chimalapa (Mexico)**

by

**Isabel A. Gutiérrez-Montes**

A dissertation submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of  
DOCTOR OF PHILOSOPHY

Major: Rural Sociology

Program of Study Committee:

Cornelia Butler Flora, Major Professor

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Iowa State University

Ames, Iowa

2005

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has met the dissertation requirements of Iowa State University

Signature was redacted for privacy.

**Major Professor**

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**For the Major Program**

**DEDICATION**

This dissertation is dedicated to the memory of my grandmother Debora Robledo de Montes, who even after she is gone, still offers me company and support. It is also dedicated to my amazing family. I can not name you all (we are too many) but it is worth it to say that I would choose every single one of the members of my family having the chance to do so. To the additional members of my family, my godchild Luis Martin Mesa, my friend Viviana Sanchez, my little sis Gabriela Flora and why not, my beloved dogs Chia and Magic. It is not a secret that Magic gave me lots of unconditional love, support and mental health during my last year here in Iowa. To you all... here you have it!!

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## LIST OF ACRONYMS

- ASPRO:** Water and Solidarity for Progress. (*Agua y solidaridad para el progreso*).
- CAPLAC, A. C.:** Communitarian Training and Planning, Civil Association (*Capacitación y Planeación Comunitaria, Asociación Civil*)
- CDI:** National Commission for Indigenous Peoples Development (*Comisión Nacional para el Desarrollo de los Pueblos Indígenas*)
- CHUDEB, A.C.:** Chimalapas United in Defense of Ethno and Biodiversity, Civil Association (*Chimalapas Unidos para la Defensa de la Etno y la Biodiversidad, Asociación Civil*)
- CI:** Conservation International
- CIP:** Council on International Programs
- CNA:** National Water Commission (*Comisión Nacional del Agua*)
- COMUNITAS:** Educative Communication for Sustainable Development Agency. (*Agencia de Comunicación Educativa para el Desarrollo Sostenible*)
- CONABIO:** National Commission for the Knowledge and use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*)
- CONAFOR:** National Forest Commission (*Comisión Nacional Forestal*)
- CONANP:** National Commission for Protected Areas (*Comisión Nacional de Áreas Naturales Protegidas*)
- CONSERVA, A. C.:** Consultancies and Agro-environmental Services, Civil Association (*Consultorías y Servicios Agroambientales, Asociación Civil*)
- COPLADE:** Planning Committee for the Development of the State (*Comisión de Planificación para el Desarrollo del Estado*)
- FIRCO:** Shared Risk Endowment (*Fideicomiso de Riesgo Compartido*)
- FMCN:** Mexican Fund for the Conservation of Nature (*Fondo Mexicano para la Conservación de la Naturaleza*)
- FOCN:** Oaxacan Fund for Conservation of Nature (*Fondo Oaxaqueño para la Conservación de la Naturaleza*)
- GIEMPBI:** Interdisciplinary Group for Participatory Research and Management of Forests and Fire (*Grupo Interdisciplinario para el Estudio y Manejo Participativo de los Bosques e Incendios*)
- IDS:** Institute for Development Studies
- IEEO:** Oaxaca State Institute for Ecology (*Instituto Estatal de Ecología de Oaxaca*)

**IMTA:** Mexican Institute for Water technology (*Instituto Mexicano de Tecnología del Agua*)

**INE:** National Institute of Ecology (*Instituto Nacional de Ecología*)

**INI:** National Institute for Indigenous Affairs (*Instituto Nacional de Asuntos Indígenas*)

**ISU:** Iowa State University

**ITAO:** Technological Institute of Agriculture of Oaxaca (*Instituto Tecnológico Agropecuario de Oaxaca*)

**MPS:** South West Peoples' Timber (*Maderas del Pueblo del Sur Oeste*)

**PA:** Attorney General's Office for Land Reform (*Procuraduría Agraria*)

**PROCYMAF:** Conservation and Forest Resources Sustainable Management Program (*Programa de Conservación y Manejo Sostenible de Áreas Forestales*)

**PROFEPA:** Attorney General's Office for Environmental Protection (*Procuraduría Federal de Protección Ambiental*)

**SAGARPA:** Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (*Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación*)

**SEDAF:** Secretariat of Agricultural and Forest Development (*Secretaría de Desarrollo Agropecuario y Forestal*)

**SEDESOL:** Secretariat for Social Development (*Secretaría de Desarrollo Social*)

**SEMARNAP:** Secretariat of Environment and Natural Resources and Protected Areas (*Secretaría de Medio Ambiente, Recursos Naturales y Áreas Protegidas*)

**SEMARNAT:** Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*)

**SERBO:** Society for the Study of Oaxaca Biotical Resources, Civil Association (*Sociedad para el Estudio de los Recursos Bióticos de Oaxaca, Asociación Civil*)

**SLU:** Swedish University of Agricultural Sciences

**SRA:** Secretariat of Land Reform (*Secretaría de la Reforma Agraria*)

**SU:** Sussex University

**USAID:** United States Agency for International Development

**WWF:** World Wildlife Fund.



## CHAPTER 1. INTRODUCTION

“The concept of modernization refers to a bundle of processes that are cumulative and mutually reinforcing: to the formation of capital and the mobilization of resources; to the development of forces of production and the increase in the productivity of labor; to the establishment of centralized political power and the formation of national identities; to the proliferation of rights of political participation, of urban forms of life, and of formal schooling; to the secularization of values and norms and so on” (Habermas 1987:2) .

Rural communities in Latin America are continuously exposed to the modernization process. The modernization development paradigm embraces the idea that *modern* is the standard used to judge societies, and that to become developed the *underdeveloped* world only needs to follow the example of the *modern* western world (McMichael 2000: 24; emphasis in original). This process results in changes within the community’s social structures as well as in its relationship with the surrounding ecological systems. The modernization that started in the North has brought new paradigms and perceptions into rural communities of the “developing” world.

External development programs and projects are generally aimed at modernization to such an extent that we can speak of a modernization movement: “The modernization movement over the last half-century or more has followed the growth model” (Bhattacharyya 2004: 26), which in turn increases differentiation within the community and deepens, despite good intentions, the existing conflicts within isolated and marginalized rural communities struggling to survive. In this study I use the experience acquired during four years of an ecological research project, which evolved into a development project under the structure of a community natural resource management process, with communities affected by an ecological disturbance. My research analyzes the relationship between the health of a rural community (with balance and synergy among the community capitals) and a healthy ecosystem (which provides required environmental services), assessing the influence of different social actors (organization) on the outcomes of the process of social change triggered by the modernization project.

In this chapter, I will discuss the relationship between the modernization process brought into the rural communities of the Chimalapas region (Mexico) after they were negatively impacted by unique forest fires in that region (a potential expression of global warming). This event brought social change to the region and modified the communities' relationship with their natural resources, while highlighting the biological importance of Chimalapas' natural resources and the threats to the communities' sustainable development.

### **1.1 Modernization and Natural Resource Management**

Even very remote areas are subject to modernization. Rural communities, surrounded by dense forest areas, and therefore supposedly protected from external influences by them, are exposed to the modernization process. Progressively they have been suffering the effects of global warming on their forests (Worldwatch Institute 2002). Further, they must deal with the growing interest of outside entities in their natural resources, either in research and preservation or in exploitation.

Isolated and marginalized rural communities have been targets of all sorts of contradictory governmental programs following specific development mandates. These range from the movement to 'modernize' in the 1950s to 'decentralize'<sup>1</sup> in the 1990s, implemented by paternalistic or clientelistic approaches (or both) (Escobar 1995. Figure 1.1). The systemic modernization process, whatever its trigger, modifies communities' interactions with ecosystems and how they manage their natural resources, producing environmental consequences.

Giddens (1990) operationalizes modernization to include industrialization, technology oriented developments, globalizing tendencies (extensional and intentional) and a future oriented society. Within rural communities, modernity and the process of modernization (analyzed in detail by the Frankfurt School theorists

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<sup>1</sup> *Decentralization* refers to ceding of power from central government to local governmental agencies with central government keeping some measure of oversight over decisions and *deconcentration* only involves the moving of central government staff to the local area maintaining hierarchical links with central government, whereas *devolution* is a more complete and permanent form of decentralization in which the power of central government is more limited (World Bank 2000b: 3.19).

such as Habermas and Marcuse) bring complexity and imply a risk (analyzed in detail by risk theory especially by Beck, Giddens and Luhmann), generating new social institutions in response to the increased complexity and risk (explained by social constructivists, e.g., Douglas and Gergen).

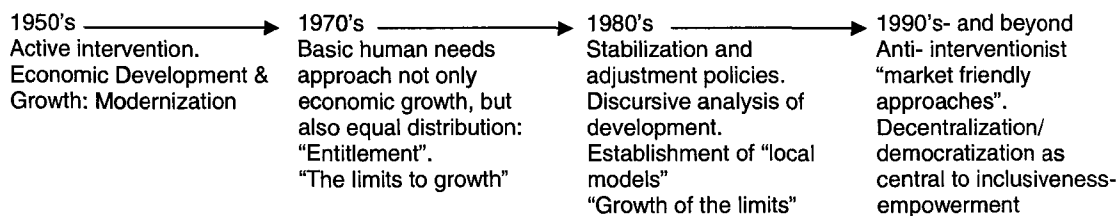
### **1.2 Modernity and Social Change**

In relation to modernity, modernization, social development and change, Habermas argues that “social change, resulting from technological innovations in the fields of production and exchange, communication and transport, the military, and medicine” (Habermas 2003: 24) is driving the modernization process.

Technologically-driven social change requires new rules and institutions.

Similarly, Marcuse (2001) also envisions “advanced industrial civilization” as a highly standardized, automated and mechanized society. This, from Marcuse’s perspective, is a result of technical developments, where “the capabilities of advanced industrial civilization suggests that this society may well be able to prevent and contain social change involving the basic institutions of society, as distinguished from changes within the given institutional framework” (Marcuse 2001: 37).

The starting point of *modernization* is increased capital accumulation invested in technology to increase productivity. These led to greater production and vigorous applications of modern scientific and technical knowledge, resulting in higher levels of industrialization, urbanization, agricultural mechanization, adoption of modern education and cultural values, and finally, higher material production and standards of living. In the 1970s the paradigm shifted towards fulfillment of basic human needs through infrastructure investment; the 1980s were characterized by *structural adjustment programs* that involved “shrinking” the state in response to the indebtedness triggered by state investment in infrastructure, while in the 1990s considerable emphasis was placed on decentralization and democratization as central to *inclusiveness* and *empowerment* in the context of shrunken states (Escobar 1995, McMichael 2000. Emphasis added) (Figure 1.1).



**Figure 1.1 Approaches to development (Escobar 1995)**

I hypothesize that development, defined as the increase of local well-being, can avoid the modernization project when it is not science and technology driven. That does not mean that science and technology cannot be drawn upon to augment local community assets. In these cases projects and programs identify and build on local community assets (self help, felt needs and participation). Such approaches do not demand capital-intensive investments, but may change social institutions to use existing resources (human and non-human) more effectively (Bhattacharyya 2004).

### **1.3 Chimalapas: Its Natural Resources and the Modernization Projects**

The Chimalapas region, in the state of Oaxaca in southeast Mexico, is one of the priority conservation areas in the country, containing some of its most important sources of water, extensive areas of well-conserved tropical forest ecosystems, and abundant species of flora and fauna (Salas et al. 2001) (Figure 1.2). The whole state of Oaxaca is "according to biodiversity experts, the most important region of Mexico for biodiversity conservation, due to its great biological richness, high degree of species endemism, and increasing risks to its most valuable ecosystems" (Oviedo 2002: 5).

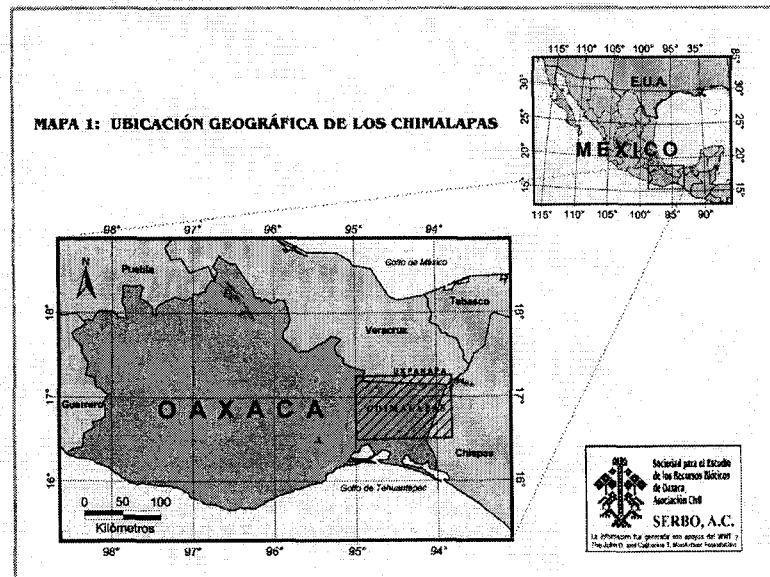


Figure 1.2 Geographic location of Chimalapas (WWF-SEMARNAP. 2001: 31).

Several internal and external pressures threaten sustainable development of the highly marginalized communities in the region. They include conflicts over the use and conservation of the biodiversity and ecological services of the region's tropical forest ecosystems and environmental degradation from over-exploitation.

Villalobos (2001) and Anta (2001) identify some proximate causes of conflicts and threats

1. Agrarian conflict (unclear property rights- individual and common);
2. Socioeconomic marginalization and migration (both in-migration from other parts of Mexico and out-migration to other parts of Mexico or even the United States), adding new pressures on the natural resource base;
3. Lack of sustainable livelihood alternatives and subsequent over-exploitation of natural resources
4. Loss of forest cover due to the advance of the agricultural frontier;
5. Unplanned and illegal forest exploitation (harvesting of timber and non-timber forest products);
6. Illegal exploitation and commerce of wild flora and fauna species;

7. Forest fires (more recently)

Oviedo (2002:10) adds two important additional causes of conflict and degradation

8. Inadequate development policies

9. Lack of incentives to strengthen community-based forest control and protection.

The above-mentioned conflicts, tensions and threats can all be related to modernization. They have either paved the way or been a result of the modernization process.

The Chimalapas communities, in spite of their relative isolation and marginalization, are constantly confronted with modernity, especially in the form of technologically driven changes, such as new means of agricultural production and exchange (including some cash crops as tomato and coffee production), communications (communities' demands for telecommunication units), transportation (establishment of a communal transportation line), education (more and more youngsters from the communities join mainstream technical education) and health services (availability of permanent non-traditional health personnel) (Habermas 2003). However, these communities have become ambivalent actors in the subsequent processes of social change with often undesirable outcomes (such as the strong presence of outsiders and their influence within community decision making structures). As the document "*Tequio por Chimalapas*" (Vocalía Ejecutiva de los Chimalapas n.d.) highlights, "External influences come to the communities, carrying other visions for the future. Enterprises of colonization, of evangelization, of commercial exploitation, of modernization and development, of ecology, and of many other things, modify communities' vision and can cause them to lose focus and harmony" (p.3). Thus, communities lose their sense of direction (based on traditions and culture<sup>2</sup>), because they face, and are forced to deal with a variety of new visions (without a clear definition of possible or desirable ends) and because

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<sup>2</sup> These refer to the more traditional cultures of the Zoque, not those of immigrants related with second phase of colonization discuss ahead

they lose harmony among themselves as a result of being forced to face too many alternatives, destinies and ends (Vocalía Ejecutiva de los Chimalapas n.d.). Arizpe et al. (1999) conclude from their research with rural and isolated communities in the neighboring state of Chiapas that “There is no doubt that global change is transforming all local inhabitants into global citizens” (p.100), moving rural communities out of their isolation and bringing the outside world into their day-by-day reality.

#### **1.4 Chimalapas and the 1998 Forest Fire Events**

Unlike temperate conifer forests, fire is extremely rare in the Chimalapas cloud forests. Despite the fact that the fires happened in the communal domain outside the communities’ daily interaction area (not directly threatening people’s lives but directly threatening their natural landscape), after the alarming 1998 fire events, forest fires are a constant threat in the region. These unusual forest fires resulted from the indiscriminate use of fire in agricultural activities as well as from natural events (lightning) (Asbjornsen et al. 2005). Changing climatic conditions, severe droughts and the increasing severity of the El Niño phenomenon, potentially linked to global warming and, in turn, to the global modernization processes of industrial growth and agricultural mechanization and expansion, have greatly increased the likelihood of fire (Worldwatch Institute 2002: 26).

The health of tropical rain forest ecosystems in the Chimalapas region is thus closely related to forest fire events. The complex causes of the fires during 1998 demonstrated that the threat of fire is made more acute by human pressures: agrarian conflict between communities, extensive agricultural practices (more and more communal lands transformed into agricultural lands, to respond to the expansion of commercial agriculture) and illicit activities such as drug cultivation, illegal logging and illegal exploitation of wildlife (also responding to modern commercial demands) (Anta and Plancarte 2001).

Anta and Plancarte (2001) explore the possible causes of the 1998 fires and suggest lack of mutual trust between different actors as a principal driver. They

argue that after experiencing the difficulties during the 1998 fires, subsequent fire seasons have been less damaging and easier to manage because of the strengthened institutional and community capacities to face and manage such events. In short, they argue that the fires increased social capital, once the communities recognized the importance of joint efforts (internally as well as externally) to mobilize resources in response to a common threat, and overcome adverse and sometimes unavoidable, ecological situations. The authors highlight the fact that Chimalapas communities are now more conscious and interested in working together to avoid a situation similar to 1998. They identified community involvement as the major challenge in the effective prevention and control of forest fire in the Chimalapas region.

Responses to the threat imposed by forest fires on the Chimalapas communities as well as on community decisions about natural resource use are subjects of continuous negotiation inside and outside the communities (with other communities, governmental entities and other outsiders).

“Rural families must constantly negotiate their livelihoods by obtaining access to natural resources, labor, capital, knowledge, and markets. Successful negotiation leads to enhanced family well-being and sustainable use of natural resources. Unsuccessful negotiation threatens family survival, threatens sustainable use of natural resources and reduces bio-diversity” (Valdivia and Gilles 2001: 5).

The negotiation process itself seems to be vital in the equation of “healthy communities equal healthy ecosystems” once one assumes that a healthy happy community (with a vibrant regional economy) and a healthy ecosystem (Flora 2004) are interdependent.

### **Outline of the document**

This document will detail the evolution of a community natural resource management process in San Miguel Chimalapa, Oaxaca Mexico that resulted from an ecological participatory project initiated as a response to the 1998 forest fire events. It is divided into eleven chapters. Chapter two introduces the theoretical framework- the Community Capitals Framework- used in the research to analyze the



health of a community and its relationship with the health of the natural environment (a healthy ecosystem). Then I describe the methodological approach used to analyze the process from the sociological point of view (Chapter Three). In Chapter Four I present a description of the Chimalapas communities selected for the participatory ecological study and their social processes in relation with the community capitals. Chapter Five addresses and discusses the 1998 forest fire effects on community capitals, which I call "The Domino Effect". Chapter Six focuses on the analysis of the response from the state agencies to the fire events and the effects of this intervention. In Chapter Seven an innovative response to the fire events is examined, highlighting the importance of more integrated collaboration between stakeholders for facing actual and potential risks. This is accomplished by mapping the main stakeholders' responses to the forest fire events and analyzing the importance of negotiating control (opening spaces to reflection), including the relevance of knowledge generated in the process. Chapter Eight analyzes factors and processes contributing to the breakdown of the participatory project. Chapter Nine discusses the post-forest fire period perspective and the tendency towards a more integrated collaboration between stakeholders as an expression of community resilience for management of new risks or a risk shift. Chapter Ten draws conclusions and highlights lessons learned during the evolution of a participatory ecological project into a community natural resource management process as a mean of community empowerment. Chapter Ten also suggests general patterns in the interconnections and interdependency among the community capitals and the degree to which modernization and community development are related (or not). Finally, Chapter Eleven presents recommendations for future research.

## **CHAPTER 2. THEORETICAL FRAMEWORK DOES A HEALTHY COMMUNITY EQUAL A SUSTAINABLE HEALTHY ECOSYSTEM?**

This chapter offers a succinct description of a healthy community based on the Community Capitals Framework (CCF). The CCF is a systems approach tool that I used as a starting point to analyze the relationship that hypothetically exists between a healthy community and a healthy ecosystem, as well as to analyze the modernization process triggered by the 1998 forest fire events in the Chimalapas region.

### **2.1 A Description of a Healthy Community Using the Community Capitals Framework**

According to Flora (2000), “communities of place and of interest have resources” (p.85) and these resources can be consumed (used up), stored (not available for use), or invested to create new resources. “Every community, however rural, isolated, or poor, has resources within it. When those resources, or assets, are invested to create new resources, they become *capital*” (Flora et al. 2004: 9). Flora and colleagues develop the Community Capitals Framework (CCF) as a useful and integrative approach to analyze and understand dynamics within rural communities.

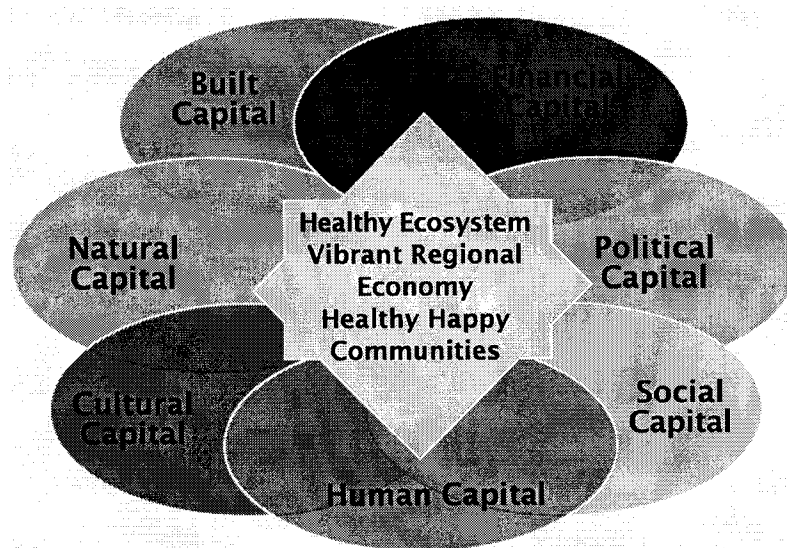
Community capitals can be divided into two main groups or “factors” essential to reach a healthy sustainable community: human and material factors<sup>3</sup>. “Human factors” comprise social, human, cultural and political capitals, whereas “material factors” comprise natural, financial and built capitals. “Natural, cultural and human forms of capital are the basic resources that can be transformed into social, political, and financial/ built capital” (Flora 2004: 8). Interdependence and synergy among community capitals is summarized by Flora et al. (2004: 71) “each form of capital has the potential to enhance the productivity of the others”.

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<sup>3</sup> Social constructivists focus on the human factors, while modernization theorists focus on the material factors

Flora et al. (2004) point out the necessity of balance among the community capitals in order to reach a *Healthy Sustainable Community* (Figure 2.1). “When one capital is emphasized over all others, the other resources are *decapitalized*, and the economy, environment, or social equity can thus be compromised” (Flora et al., 2004: 9). Likewise when one of the community capitals is severely affected or *depleted*, the health and sustainability of the community is compromised.

Analogous to Flora’s emphasis on the importance of simultaneous and balanced investments in the community capitals to accomplish a healthy sustainable community, Schneider (2004: 3) argues, “While increased economic security for neighborhood families and investment in community institutions are necessary for healthy communities, these ingredients are not sufficient in and of themselves to engender neighborhood cohesion”. She continues “Establishing healthy communities also requires that communities develop trusting connections with citywide institutions, markets, and policy makers to ensure that the neighborhood receives the resources that it needs, and that families have a bridge between their local communities and the wider society to achieve their goals”.



**Figure 2.1 Healthy community= Healthy ecosystem: synergy and balance of forms of community capitals (Flora 2004)**

Similar arguments used by Schneider (2004) for United States neighborhoods are applicable to the situation of isolated and marginalized rural communities in the Chimalapas region. The vision of a healthy community in the Chimalapas context is much more than just economic (financial capital) and/or infrastructural investment (built capital). A healthy community reinforces connections and relationships (social capital), respect for and inclusion of cultures (cultural capital), access to different levels of power (political capital), sustainable use and care of communal natural resources (natural capital) and development of local skills and knowledge (human capital) in a synergy that can enhance the overall well-being of individuals and households within the communities and will in the end allow the community to ensure actions towards a healthy ecosystem.

### **2.1.1 Social Capital**

Social capital refers to the interactions, connections and relationships that tie individuals and communities together. “Social capital includes the networks, norms of reciprocity and mutual trust that exist among and within groups and communities. It contributes to a sense of a common identity and shared future. Community social capital facilitates groups’ working together” (Flora et al. 2004: 9). Three forms of social capital are essential ingredients in order to reach a truly healthy sustainable community: bonding social capital (strong ties that connect individuals and groups from similar background, leading to social/community cohesion), bridging social capital (weak ties that connect different groups together within and outside the community) and linking social capital (weak ties that connect communities with external organizations: extra local ties) (Flora et al. 2004, Schneider 2004, World Bank 2000a).

Fukuyama (2001) defines social capital as “an instantiated informal norm that promotes co-operation between two or more individuals” (p. 7). According to Fukuyama, in the economic sphere, social capital reduces transaction costs (economic efficiency) “and in the political sphere it promotes the kind of associational life which is necessary for the success of limited government and

modern democracy” (p.7). In a study analyzing the cultural and social dimensions of the destruction of the natural environment in the neighboring state of Chiapas, Arizpe et al. (1996) conclude

“Environmental change cannot be studied only as a direct relationship of an individual to the natural environment. Instead, individuals’ choices and behavior toward nature are shaped and channeled by preexisting conceptual frameworks and by the matrix of social relationships in which each individual’s group is embedded” (p.93. Emphasis added).

Fukuyama (2001) highlights social capital’s role in economic and political spheres whereas Arizpe et al.’s (1996) conclusions give social capital a key role within the environmental sphere. Both arguments demonstrate how social capital is progressively intertwined in the economic, political and environmental arenas of the modernization process that rural communities constantly face.

### **2.1.2 Human Capital**

“Human capital includes those attributes of individuals that contribute their ability to earn a living, strengthen the community, and otherwise contribute to community organizations, to their families and to self-improvement” (Flora et al. 2004: 80).

Human capital is the skills, knowledge and abilities of local people to use, develop and enhance other human and material resources, as well as to seek access to resources outside the community (Coleman 1988, Flora et al. 2004). Human capital embraces formal and informal education and training, skills and knowledge (both expert and local/indigenous), individual health and health conditions and leadership and collaboration skills.

Although in rural areas in Latin America the education system is poor, there are other valuable expressions of human capital, such as local/indigenous knowledge, experience and leadership skills. The same can be said about a health system that includes and acknowledges relevance of traditional knowledge (e.g., midwives (*parteras*), bone setters (*hueseros*), traditional herbalists (*yerberos*), etc. The modernization process has an important role in introducing modifications in rural

communities' human capital, once it introduces the necessity of new knowledge (Western scientific and technological knowledge) and non-traditional health practices.

### **2.1.3 Cultural Capital**

"Cultural capital includes the values and symbols reflected in clothing, books, machines, art, language, and customs. Cultural capital can be thought of as the filter through which people live their lives, the daily or seasonal rituals they observe, and the way they regard the world around them" (Flora et al. 2004: 25).

Cultural capital determines how we see the world and therefore act, and moreover what we take for granted, value, and think possible to change (Flora 2004). Schneider (2004: 10) refers to cultural capital as "the way of life of a community, including its economic strategies and social organization, in addition to its habits and belief systems". Schneider (2004) also argues that cultural capital plays a role in which agencies or institutions people use and trust and is also a powerful determinant of who is allowed to use the resources within a community.

Adorno (1991) perceives and argues in favor of culture as a social institution and as such "Whoever speaks of culture speaks of administration as well", despite that, according to German thought, "culture is opposed to administration" (Adorno 1991: 93). The role of culture as a social institution in modern times is to promote and facilitate emancipation (autonomy of culture) and rebellion against the *status quo* (and all its governmental agencies).

Considering the impact and role of culture in the process of modernization and social change, for some authors, culture is a means of control (Horkheimer 1974) or indoctrination (Marcuse 1964) and, in the opposite extreme, for others culture is also a mean of emancipation (Gergen 1991, Habermas 1987 and Adorno 1967, 1991). In the case of culture as emancipation, cultural (and traditional) practices within communities could be perceived as traditional obstacles to making the transition towards development (McMichael 2000)

Uses of traditional knowledge to supplement and sometimes replace the poor health system could be included as an important expression of Latin American rural communities' cultural capital, as it is communities' demands for the inclusion of local knowledge within any external research project that involves communities' communal natural resources.

#### **2.1.4 Political Capital**

Weber (1947: 155) defines the term "political" as "Things that have to do with relations of authority within what is, in the present terminology, a political organization, the state".

Flora et al. (2004) move beyond governmental powers, asserting that "Political capital consists of organization, connections, voice and power. Political capital is the ability of a group to influence the distribution of resources within a social unit, including helping set the agenda of what resources are available" (p.108), and Levitte (2004) concludes,

"Further analysis into relationships with external networks should address questions of power... It would be valuable to understand the power of regional, provincial, and national networks in shaping local economic development priorities and local decision-making processes... It may be useful to explore whether the regional organizations responsible for disseminating the government programs provide a forum in which community members participate in a meaningful discussion about the direction their community is taking, or whether these organizations are only a tool to carry out policies designed elsewhere" (Levitte 2004:58- 59).

In an isolated rural community, political capital reflects the ability to deal with coercion and enforcement, the ability to participate and have a voice and the ability to access power and influence decisions and actions that in a modernization process will transform all the other community capitals. Within the communal tenure system of the analyzed Chimalapas communities', political capital is expressed in the access to resources granted to the community members as well as in the power assigned to the authorities (local and municipal).

### **2.1.5 Natural Capital**

Natural capital refers to environmental assets/resources and the physical environment in the community including air quality, quantity and quality of water, biodiversity (plants, animals, agricultural germplasm), soil, forests, landscape, ecosystems knowledge and appreciation of the environment (Flora et al. 2004, Flora 2004). Regarding the necessity of new models of development and acknowledging the importance of the natural environment for development of poor and isolated communities target of development programs, Worldwatch Institute (2002) mentions that the impact of deforestation is most devastating to the poor. Deforestation has direct and indirect effects over the lives and livelihoods of forest dwelling peoples “for whom the trees are a source of food, income, and cultural and spiritual wealth” (Worldwatch Institute 2002:9). Modernization theory sees natural capital as a source for capital accumulation, making difficult any attempt to reverse the deforestation and depletion of resources that severely affect rural communities.

### **2.1.6 Financial Capital**

Financial capital includes debt and investment capital, savings, tax revenues, tax abatements and grants. In general terms there is a consensus that financial capital is more than just money, although money is financial capital's yardstick. “Financial capital consists of instruments that express exchange value and that have a high degree of liquidity compare to other forms of capital” (Flora et al. 2004: 186). In rural communities in Latin America, isolation and marginalization directly affect financial capital because they are translated into limited access to markets. Modernization theories and approaches stress the causal importance of financial capital in bringing about change, stressing the need for accumulation (economic growth), high mass consumption and its concomitant inequality (Rostow 1962)

### **2.1.7 Built Capital**

Built capital comprises the physical infrastructure supporting social and productive activities within a community, i. e. roads, communications, utilities (water,



electricity, gas), waste management, schools, church, hospitals, public and commercial buildings, etc. While built capital can be exchanged for money, its worth may not be fully expressed in monetary terms. "Built capital is the permanent physical installations and facilities supporting productive activities in a community... the built capital of a community refers to the equipment needed to support a series of networks that enable people to travel, communicate with one another, and gain access to services and markets" (Flora et al. 2004:191). Modernization places special emphasis on technology-enhanced built capital.

Most of the communal buildings of the Chimalapas communities including some of the school classrooms, the communal house, the health clinic, the basketball court and soccer fields, are the product of the obligatory communal work done in Chimalapas and within Oaxacan communities, which is called *tequio*. The main role of *tequios* within the studied communities is to construct and maintain basic infrastructure to support its social and productive activities.

## **2.2 Sustainable Healthy Ecosystems**

Flora et al. (1999) argue that their outcome, shown in the middle of the CCF figure, "Sustainable, Healthy Ecosystems with multiple Community Benefits" is based on the explicit linkage of human communities and natural ecosystems:

"Human communities are part of natural ecosystems. The responsible stewardship of natural resources sustains businesses and families in communities over the long term. Finding the common ground among people who have emotional, symbolic or economic identification with place, whether or not they live there, is essential to making decisions about development and resource use that will enable communities and their resource base to survive and thrive" (Flora et al. 1999: 53).

Ecosystems, the totality of natural capital, include air (quality), water (quality and quantity), soil (quality), biodiversity (plants and animals) and landscape (sense of place), and its health "is maintained best when citizens have and use knowledge about their ecosystem to guide their behavior" (Flora et al. 1999:53).

### **2.3 Using the Community Capitals Framework to analyze modernization within the Chimalapas research**

In this study I critique modernization theory with the theories of Frankfurt School theorists (Adorno, Habermas, Horkheimer and Marcuse). These theorists are critical of the modernization process, because it ignores the social constructivism school of thought (especially Burke, Douglas and Gergen) that explains the growing necessity of new and responsive institutions. Such institutions are critical for community adaptation to adverse circumstances (1998 forest fire events), and to utilize local resources (human and material) key to that change- the community capitals (Flora et al. 2004).

The Community Capitals Framework provides the foundation for developing my major theoretical concepts as well as for building a better system model to analyze the impact of the modernization project that started in the isolated and marginalized rural communities as a result of an ecological disturbance. Additionally I will bring into the discussion some risk society theorists (Giddens, Beck and Luhmann) to illuminate the interactions between increasing threats and institutional change.

### **2.4 Modernization, Social Change and Action**

The use of language, culture, communicative action and communication mechanisms (Adorno 1991, Burke 1954, 1969, Gergen 1971, 1991, 1999, Habermas 1987, 1990) and emerging collective identity in a context of differentiation (Burke 1969, Habermas 1990, Gergen 1991b, 1997, Giddens 1990, Luhmann 1993) is critical in understanding modernization, risk, and the response of community and external institutional actors.

In a paper intending to understand the role of institutions in the performance of economics, North (1991) argues

“Institutions are humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Through history, institutions have been

devised by human beings to create order and reduce uncertainty in exchange” (North 1991: 97).

In Douglas’ (1986) words, “To acquire legitimacy, every kind of institution needs a formula that found its rightness in reason and in nature” (p. 45). Institutional organization is a source of social order, providing solution to problems as well as with a coordination role. Gergen (1994) introduces the concept of institutional *interdependence*. In terms of social, cultural and political capitals, institutional coordination indicates what is problematic and a possible solution in places where there is a huge institutional overlap. Institutions must encode expectations and put uncertainty (disorder and confusion) under control (to bring back and offer social order) (Douglas 1986) building mainly on political, social and cultural capitals.

To the social constructivists, as well as to the risk society theorists, the main role of institutions is to respond to societal risks (Douglas 1986, 1992, Gergen 1991b, 1997, Giddens 1990, Luhmann 1993). Institutions in traditional societies certainly deal with risk, but new risks are introduced by modernization, requiring extra-community linkages (linking social capital and political capital) to reduce the impact of new risks, thus explaining the increased role of the central governments. Institutions begin to change (and become more global) and accept that they must create an atmosphere that acknowledges and accepts a threatening future (Beck 1999, Douglas 1992). Institutions are pressured to manage risks through insurance schemes and regulation of the economy and environmental use (Beck 1999). These institutional shifts directly affect local political and natural capitals. Modernization processes increase sources of risk from external sources, requiring changes in balance and synergy among the community capitals in order to respond to these risks. Local institutions respond to the risk by sometimes investing in the different capitals and sometimes introducing regulations (political capital) in order to simultaneously recover and transform them as part of a whole system (the community). But more often, the institutional response is from the outside, requiring further adjustment of the local capital balance.

Giddens (1990) argues that institutional developments are responsible for creating the present sense of fragmentation and dispersion as they attempt to mitigate specific risks. Yet modern institutions must engender trust in order to be deemed effective, requiring investments in social and cultural capital. "Trust is therefore involved in a fundamental way with the institutions of modernity" (Giddens 1990: 26). The author suggests that this trust offered by modern institutions must resemble confidence, reliance, and faith. These are difficult to incorporate in fragmented, dispersed institutions.

Douglas (1986) analyzes what motivates the presence and relevance of institutions. Discomfort comes with uncertainty (or risk), yet in the presence of institutional fragmentation it is necessary to encode expectations and to reach coordination and control. Institutions produce "labels" and make classifications: "The labels stabilized the flux of social life and even create to some extent the realities to which they apply" (Douglas 1986: 100). In the Chimalapas case, the most important institutions are governmental agencies in charge of natural resources management and non-governmental as well as research organizations interested in conservation and sustainable management of natural resources.

Habermas (2003) argues that knowledge (science) is necessary for modernization to occur. With scientifically driven intentions to generate knowledge around the capitals, often hoping to use that knowledge to generate technology to control them, research organizations enter in the rural communities as a vector of modernization. Analyzing the importance/relevance of knowledge and science, the critical theorists concur in their appreciation that knowledge and science are an important source of social transformation. They affect not only communities' human capital, but also the rest of the capitals, once human capital (especially, in relation with knowledge) can be invested to help recover or operate to the detriment of the rest of the community capitals.

Recognizing knowledge as a critical component of modernization, Habermas (2003: 24) points to "institutionalized research" as a driving force behind progress (understood as advances of science and technology in modern times). He argues,

“From the perspective of the liberal state, the freedom of science and research is enshrined in legal guarantees. Any enhancement of the scope and focus of the technological control of nature is bound up with the economic promise of gains in productivity and increasing prosperity, as well as with the political prospect of enlarging the scope of individual choice” (Habermas 2003: 24). In this model, science enhances human, built and natural capital to increase financial capital.

Access to knowledge is a factor in community social and economic differentiation (Gergen 1999, Giddens 1990, Horkheimer 1974) and thus political power. Knowledge, technological and scientific, is a means of control and manipulation as expression of power, with strong effects on political capital (Burke 1969, Giddens 2000, Marcuse 2001), Knowledge is key in the process of control and manipulation of any form of opposition (Marcuse 2001). “Under the impact of technological and scientific conquests, the size and efficacy of the productive apparatus, and the raising of standard of living [financial and built capitals], the political opposition against the basic institutions of the established society succumbs [political capital] and turns into opposition *within* the accepted conditions” (Marcuse 2001: 38. Emphasis in original). Knowledge is also a tool and opportunity to improve lives (Gergen 1999) when it is transformed in human capital and invested to enhance the other community capitals. But knowledge is also a source of risk (Beck 1999, Giddens 2000, Douglas 1992 and Luhmann 1993) as it brings unintended and unforeseen consequences to the community capitals.

Marcuse (2001:57) links modern science (expressed in technological advances) and industrial society “The technology which the industrial societies have inherited and developed, and which rules our lives, is in its very roots a technology of domination”. Domination not only over nature (natural capital) to produce -mass production- (financial and built capital) and fulfill the growing demands of a growing population (human capital) -mass consumption-, but moreover domination of individual autonomy reducing the opposition to the *status quo* which Marcuse (2001) calls repression (political capital). Technology is a social construction, a social project for control and domination of both the human and material factors.

## **2.5 Research Question**

In this study I analyze how, after the occurrence of an ecological disturbance that primarily affects the communities' natural capital, an outside entity (that is part of the larger political capital) enters and affects the balance and synergy of community capitals (mobilizing other capitals) and impacts communities. I will also analyze the implications of the intervention of the scientists as a central part in the modernization process at the community and regional levels.

## **2.6 Research Objectives**

I examine how the accelerated modernization process within rural communities following an ecological disturbance attracts the attention of local, national and international sectors of society. More specifically, I

- Map the asset base of the communities after an ecological disturbance using the community capitals during the process
- Assess the impact of the ecological disturbance on capital assets.
- Analyze how institutional actors affect the process of recovery and transformation of the community capitals.

### CHAPTER 3. SOCIOLOGICAL METHODOLOGY: HOW TO ANALYZE THE PROCESS

My work with rural communities has taught me that “one size **does not** fit all”. In other words, no matter how determined the researcher is to conduct a truly participatory study when entering isolated and marginalized rural communities, the only constant and sure thing is the fact that new barriers to participation continuously emerge. The researcher must be ready to move within the changing panorama outside academia and inside rural community life, varying roles and being ready to gather and analyze the available information (data), keeping in mind validity issues. Thus she or he must be flexible and ready to adapt concepts, methodologies, theories and hypotheses responding to the moving target of understanding the processes that communities go through. This chapter captures my experience with the Chimalapas communities, from the time I entered the communities to analyze the social impact of the 1998 forest fires.

#### 3.1 My Role

In order to clarify the methodological approach used during the research, it is necessary to briefly describe my role and presence within the project as a sociologist. I started my relationship with the communities and the Interdisciplinary Group for Participatory Research and Management of Forests and Fire, *Grupo Interdisciplinario para el Estudio y Manejo Participativo de los Bosques e Incendios* - GIEMPBI team during my first trip to Oaxaca Mexico, in the summer 2002. The original plan was to accompany and document a Participatory Action Research (PAR) within the communities. The PAR methodology was modified due to circumstances described and analyzed below, and evolved into a qualitative and more theoretical analysis of the process of institutional engagement and its effect on and responses of the communities.

To be consistent with my ideas of construction and development of social capital, during my first year of trips to Mexico, I acted as a participant-observer to

gain trust and become acquainted with people from the communities as well as with the project's main stakeholders. After two trips into the communities and some time spent in Oaxaca as part of the research team, I moved to a more active role, facilitating some of the GIEMPBI presentations in community assemblies, negotiating our presence within the two communities engaged in the ecological research, facilitating a focus group with one of the community's research committee, as well as the first participatory evaluation of the ecological project. At the same time I started a series of interviews with the main project stakeholders in order to start a participatory systematization of the project after three years of the GIEMPBI work.

My original plans were to spend three months in summer 2004 within the communities and to jointly 1) finalize the participatory systematization that was already started; 2) work with the two selected communities (Benito Juarez and San Antonio) and the municipality of San Miguel Chimalapa in a Participatory Action Research project using the Community Capitals Framework (Flora et al. 2004) (using the participatory systematization as a starting point for reflection), 3) analyze the community capitals after the forest fire events, 4) select indicators of progress towards community-identified goals towards a healthy community and thus 5) test a community Monitoring and Evaluation program.

The political situation in the region, due to gubernatorial elections and the ever-present and exacerbated agrarian conflict, along with GIEMPBI team's lack of funding, rendered the team unable to respond to the communities' demands to support the productive community projects. Therefore, the communities denied permission to conduct the research as planned. This truncated my ability to conduct a Participatory Action Research within the Chimalapas communities involved in the GIEMPBI project.

After these events, I redirected my efforts towards the systematization and qualitative analysis of the immense amount of information collected during more than two years of periodic trips to Oaxaca City and into the Chimalapas communities. Through this redirection, I worked to understand the impact of institutional engagement on community capitals. As a sociologist accompanying the



process during the GIEMPBI project breakdown, the transition from the participatory research approach towards a non-participatory systematization and analysis of the process was a turning point. It meant that the initial hypotheses could not be completely tested, and the idea of jointly constructing indicators for each one of the community capitals to analyze the relationship between the health of a community and the health of an ecosystem was impossible to accomplish. Instead, I theoretically constructed indirect indicators for each one of the community capitals as I reframed the study from one about the communities and the ecosystem to a study of the intervention process itself in terms of the institutions-community interactions around the seven community capitals to highlight lessons learned.

### **3.2 Data Gathering**

During the first year, my role was more an observer than an active participant, but in the last year, my participation was more active, facilitating meetings with the communities, conducting interviews with key stakeholders, facilitating part of the participatory evaluation of the project and a focus group with the community committee, and collecting key informant data within the communities. Those activities provide the data I analyzed and highlighted some lessons learned during the four years of GIEMPBI project work with the communities. Facts and findings were constantly crosschecked and validated with interview respondents and key informants.

Data were collected and triangulated through in-depth, semi-structured interviews (Fontana and Frey 2003) with main actors/stakeholders of the project, including interviews with community members, governmental organizations (GOs) officials, local and international non governmental organizations (NGOs) members and other local and international researchers involved in different stages of the ecological analysis of the forest fires impact project. I developed a protocol to conduct interviews with different actors involved (including community leaders) in order to start a participatory systematization of the ecological research (Selener et al. 1996). The instrument included questions about the project's conceptual

framework (vision, mission, goals and objectives) and the social and political context (national, regional and local) when the project started. Additionally, I asked about personal assessments of the main stakeholders, the nature of the project, the process, and the main results (impacts and lessons learned) (Appendix 1).

Fourteen respondents<sup>4</sup> were interviewed individually, or in pairs when interviewees requested so, during the second year of field trips to Oaxaca. In addition, data are supplemented with notes from key informants (people outside the project but knowledgeable and/or related with the region), informal conversations without an interview instrument and not electronically recorded, a focus group (Madriz 2003) conducted with the community ecological committees during a participatory evaluation of the ecological project (Appendix 2), participant observation (Angrosino and Mays de Perez 2003) in community assemblies and meetings, and notes on several meetings with key stakeholders in Mexico D.F and Oaxaca City over a period of two years of visits with the communities. Seven trips and visits that lasted from two weeks to three months.

Finally, I analyzed and systematically reviewed project documents such as reports from workshops, project technical reports, memoranda of understanding and the available information collected during the time of the ecological research on the effects of the forest fire events.

### 3.3 Validity Issues

Very often, sociological literature considers participatory methods as undisciplined, sloppy, subjective, informal, and extremely qualitative, meaning, in other words, poorer quality or even second-rate work (Pretty et al. 1995). Lincoln &

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<sup>4</sup> The purpose used to select respondents was their involvement within GIEMPBI project. Respondents were pointed as main actors/stakeholders of the project. These interviewees comprise three women: the Chimalapas Giempbi PI, the sociologist of the project, and an agronomist from a Oaxacan NGO. And eleven men: the Director of the educational institute in Oaxaca, the Director of IIEO at the beginning of the project, a staff member from CONAFOR, a Oaxacan antropologist, a staff member from an international NGO, a GIEMPBI-project biologist, an agronomist from *Procuraduría Agraria*, two community leaders, a professor from the technological institute, a community member with knowledge about the project.

Guba (1985 in Petty et al. 1995: 57) explore validity, reliability and objectivity issues of Participatory Research Analysis:

1. How can we be confident about the "truth" of the findings (internal validity)?
2. Can we apply them to other contexts or other groups (external validity)?
3. Would the findings be repeated if the inquiry were replicated with the same (or similar) -subjects/ context- (reliability)?
4. Are the findings determined by subjects not by the researcher (objectivity)?

**Table 3.1 Criteria for establishing trustworthiness met or not during this research. (Based on Petty et al. 1995)**

Criteria of trustworthiness	Met	Not met, why?
1. <i>Prolonged/ intense engagement</i> : between researcher and participants	Partially	Initially met (first two years of trips) until the participatory project breakdown
2. <i>Persistent and parallel observation</i> : understanding of phenomenon and context	Yes	
3- <i>Triangulation/</i> cross checking: sources, methods and investigators	Yes	
4. Acceptance and analysis of differences including a wide range of involvement	Yes	
5. <i>Negative case analysis</i> : sequential revision of hypotheses	Yes	
6. <i>Peer/ colleague checking</i> : periodical review	Yes	
7. <i>Participant checking</i> : testing data, interpretation and conclusions	Partially	Initially met (first two years of trips) until the participatory project breakdown
8. <i>Reports with working hypotheses/</i> visualizations and quotation: people's personal perspectives and experiences	Yes	
9. <i>Parallel investigations and team communications</i> : trustworthy findings	Yes	
10. <i>Reflexive journals</i> : variety of information	Yes	
11. <i>Inquiry audit</i> : confirm findings	No	Participatory project breakdown
12. <i>Impact on stakeholders' capacity to know and act</i> : demonstration that the study has had impact on the people	No	Participatory project breakdown

In order to address issues within participatory (and qualitative) research, Petty et al. (1995) identified a set of 12 criteria for establishing trustworthiness, criteria that during my research I tried to meet in order to reach internal and external validity as well as reliability and objectivity, on the assumption that the circumstances allowed for a complete qualitative research. Table 3.1 presents the complete list of criteria confirming which ones in my opinion I met as well as those I did not meet and why.

### 3.4 Operationalization of Research/ Concepts

Considering that this research is a systems approach, I selected all the indicators of a healthy community and a healthy ecosystem to reflect the effect of the 1998 forest fire events on the communities' capitals and the expression of community resilience as a means to achieving a synergy among the community capitals. Gradually I realized that the research act itself was an intervention that became important in terms of how it affected the community capitals. Thus the different indicators reflect my personal perceptions of the post forest fire period in which I examined how GIEMPBI and the other outside institutions with which it partnered affected each of these indicators.

#### 3.4.1 Healthy Community

I define a healthy community as one seeking balance and synergy among the community capitals: natural, social, human, cultural, political, financial and built.

To analyze **social capital** related to forest fires, it is important to look at community organizational capacity (COC) as well at networks: bonding, bridging as well as extra-local ties (linking). I chose the following indicators for these key aspects of social capital.

#### COC

- Community organizations related specifically to community issues
- Formal and informal organizations/committees to which community people belong
- Diversity of community organizations/committees people belong

Bonding social capital (linkages and relationships inside of the community)

- Community groups organized after the 1998 forest fires<sup>5</sup>
- Increased percentage of community people belonging to those groups
- Community degree of activity to prevent forest fires<sup>6</sup> (community initiatives/activities to prevent forest fires)
- Degree of community activity to fight forest fires (brigades formed, increased number of people belonging and active in the brigades to fight forest fires)

Bridging social capital (links with external organizations -NGOs, GOs).

- External contacts made by the community to improve their skills and ability to control fires
- Projects conducted jointly with external organizations
- Changed percentage of community people participating actively in the projects

My indicators of **human capital** related to forest fires are

- People from communities who are participating in training courses
- Prevalence of diseases related with forest fires (respiratory, gastrointestinal, dermatological, etc.)
- Young people from the communities that enter the forestry school or other types of high school

My indicators for **cultural capital** related to forest fires are

- Inclusion of local knowledge within the brigades to prevent and control forest fires
- Effects of forest fire events over the community germplasm

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<sup>5</sup> Including all the new community groups organized, whether they are directly related to forest fires or not, given that the forest fires triggered the outside interest that then resulted in a variety of new contacts from the government and NGOs

<sup>6</sup> One could argue that all activities aimed to promote sustainable development, including productive projects, were activities at least justified in terms of preventing forest fires (human induced).

- Awareness of the effects of forest fires on the communities' unique ecosystems
- Use of the cultural heritage within negotiation processes after fire events

My indicators of **political capital** related to forest fires are

- Increased voice of local communities in decision making to prevent and control forest fires
- Empowerment of communities to negotiate terms of agreement/operation and finally accept or reject external groups seeking to conduct research in the communities
- Community control and access to resources as determined by communal tenure system (uses, customs and traditions) and increasingly affected by external demands for regulatory control (by state/federal governments)
- Community initiatives to participate in the agenda setting and final decision making over their communal natural resources
- Community organizations promoting a common vision for the future, supported by strong internal political organization under effective leadership

My indicators of **financial capital** related to forest fires are

- Community economic activities related to forest products
- Agricultural activities affected by the forest fire events
- Working days lost by community members due to their involvement in fighting forest fires
- Funds from external governmental or non governmental organizations for community projects
- Vehicles within the community facilitating access to markets

My indicators of **built capital** related with forest fires are

- Establishment of telecommunications facilities within the communities
- Improvement of roads to facilitate the access of fire fighters' brigades

- Improvement of community infrastructure in relation with forest fires (e.g., health facilities, communal house, etc.)

### **3.4.2 Healthy ecosystems.**

Using indicators from Flora et al. (1999) for their outcome “Sustainable, healthy ecosystems with multiple community benefits” as a starting point, I theoretically constructed measurements for the following indicators:

- Air (quality): reports, complaints and comments on air quality.
- Water (quantity and quality) this indicator has been very sensitive to the communities after the forest fire events of 1998.
- Biodiversity (plants, animals, agricultural germplasm), related to ecosystems recovery
- Soil (quality). In relation to agricultural yields.
- Ecosystems knowledge and appreciation of the environment. Relevance of scientific and local knowledge.
- Decreased incidence of human induced fires (number of forest fire events, area affected by the fire event)

## CHAPTER 4. DESCRIPTION OF THE SITE AND ITS PROCESSES IN TERMS OF THE COMMUNITY CAPITALS

In this chapter I describe the San Miguel Chimalapa municipality and the four pilot communities that were initially selected; in the end, only two became part of the study for reasons explained in chapter seven. I describe the site and its processes in terms of the seven capitals and degree of modernization.

From the 17 villages of San Miguel Chimalapa visited during the exploratory/planning phase of the project, GIEMPBI, along with municipal authorities, selected four as pilot communities to conduct the participatory research on ecological and social impacts of 1998 forest fire events (See chapter seven). These communities include Benito Juárez and San Antonio –recently colonized communities and located in the eastern region- and Los Limones and Las Conchas –older communities located in the south central region- (Table 4.1, Figure 4.1).

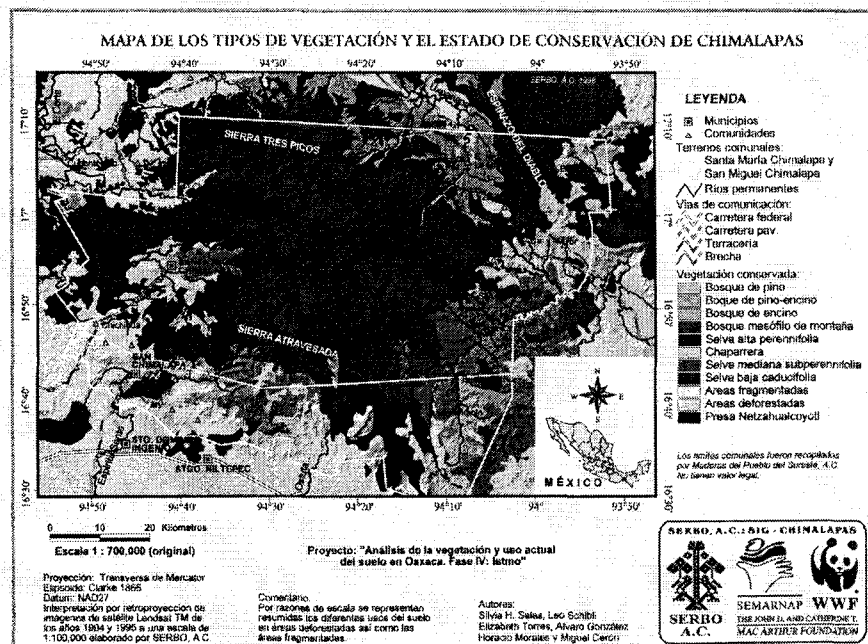


Figure 4.1 Chimalapas communities included in the project



#### 4.1 Human Capital

Las Conchas is one of the largest villages in San Miguel Chimalapas, with a population that is almost 1/5 of the total population for the municipality (Table 4.1). The newer communities (Benito Juárez and San Antonio) grew rapidly (doubled their population) between 1990 and 2000. This population growth is mainly due to high rates of in-migration while the older communities showed much more modest increases (based primarily on natural growth). The 2000 census data reports that of the total population (5947) of San Miguel Chimalapa, 270 were born outside of the region (or the country). From the total 270 individuals living in the municipality that were not born there, San Antonio attracted 86, Benito Juárez 41, Los Limones 20 and Las Conchas 0. (INEGI 2000).

**Table 4.1 Population trends in the participating communities (INEGI 1990, 2000)**

	Population					
	1990			2000		
	Male	Female	Total	Male	Female	Total
<b>San Miguel Chimalapa</b>	2853	2830	5683	2965	2982	5947
<b>Las Conchas</b>	441	466	907	443	509	952
<b>Los Limones</b>	194	212	406	233	241	474
<b>Benito Juárez</b>	83	70	153	167	155	322
<b>San Antonio</b>	74	46	120	135	127	262

The 2000 census found a total of 88 out-migrants<sup>7</sup> from the Municipality of San Miguel Chimalapas between 1995 and 2000. Out-migration from San Antonio during the period was 13 people, Los Limones 10 people, Benito Juárez 3 people and zero out-migration for Las Conchas. Net migration affects the rest of the capitals. Net in-migration results in the necessity to expand the agricultural frontier and creates more demands for services affecting human, built and natural capitals. Whereas net out-migration will have an impact not only on human capital (due to loss of population), social capital (bonding social capital) and cultural capital (local knowledge and traditions) but also on natural capital especially related to

<sup>7</sup> Out Migration: population older than five years that had residence in other region or country in 1995 (INEGI 2000).

remittances invested in livestock<sup>8</sup> and/or loss of germplasm<sup>9</sup>. Gross migration (high population turnover) affects social and cultural capital, and through these, human capital and natural capital (less knowledge of the ecosystem and its limits).

The 2000 census indicates San Miguel Chimalapa had an average educational level of 3.69. The lowest mean level (average educational level) among pilot communities is found in San Antonio (2.64), followed by Benito Juárez (3.13). Las Conchas (3.36) and Los Limones show the highest average (4.18) above the mean for the municipality (INEGI 2000).

Both San Antonio and Benito Juárez have health services provided by the state secretariat of health. Teams called “health promoters” (comprising two nurses, a nurse’s-aide and a doctor) visit the communities every fortnight for two days. The rest of the time communities rely on indigenous knowledge, in the persons of midwives and healers (bone and herbal). There is knowledge exchange among traditional and western medicine. The health secretariat promotes the training of the traditional healers to attend to medical emergencies that may arise (personal communication, young male doctor serving the communities. July 2004).

## 4.2 Cultural Capital

In rural communities, cultural capital results in part from the long-term interactions of humans with the ecosystem. The age of the community (when it was founded and settled) thus impacts its cultural capital. Las Conchas is considered one of the oldest localities of the municipality. Viqueras (1999) identifies 1880 as the foundation year, although in a footnote he cites that other documents have 1850 as the foundation year (e.g., *Vocalía Ejecutiva de los Chimalapas* n. d.). De Teresa (1999, 2001) mentions that Las Conchas was founded during the so-called “First Phase of Internal Colonization (1800- 1950)” in year 1840, through a spontaneous

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<sup>8</sup> Because families are sharing communal lands, remittances cannot be invested in acquisition of land, but in animals that are consider a source of security (preferably beef cattle and goats) which will require expansion of the agricultural frontier to the establishment of cattle ranch.

<sup>9</sup> If family moves definitively, beans, corn and squash germplasm that they have been managing for long time will be lost, as that on-farm conservation is “recognized as a key component of a strategy to conserve crop genetic resources” (Bellon et al. 2003: 401)

local colonization of Zoque to occupy and defend their territory<sup>10</sup>. Los Limones was founded in 1880, also part of the “first phase of colonization” (De Teresa 1999, 2001). The Benito Juarez community was founded in 1972, although some authors mention 1979 as the foundation year (Vocalía Ejecutiva de los Chimalapas n.d.), by a group of Zoque indigenous people that claimed their rights over their communal lands, along with people from other parts of Oaxaca or even other states, during what has been called the “second phase of internal colonization (1950-1995)” (De Teresa 1999). The fourth community selected was San Antonio. Zoque indigenous people and *mestizos* from other parts of the state and country mainly from Benito Juarez founded San Antonio in 1984. It is the second community formed in the eastern region of the municipality of San Miguel after Benito Juarez. In general, the two communities share not only origins but also common goals and common issues (Vigueras 1999).

In reference to the use of indigenous language within the pilot communities, the 2000 census reports that 30.7% of the population of San Miguel Chimalapas (1827 out of the total population of 5947) speaks a native language. The figure for Las Conchas is 47% (448 out of 952), San Antonio 38.5% (101 out of 262), Benito Juarez 24.5% (79 out of 322) and Los Limones 11.8% (56 out of 474) (INEGI 2000).

### 4.3 Social Capital

The Catholic religion traditionally has been predominant in the Chimalapas, but there are differences in its influence within the pilot communities. In San Miguel Chimalapas as a whole, 60% of the population 5 years and older is Catholic, while the rest (40%) of the population 5 years or older is non-Catholic or has no religious affiliation (INEGI 2000). Benito Juarez has the largest percentage of Catholics

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<sup>10</sup> History of colonization in the Chimalapas could be traced back from the re-purchase and occupation of lands, historically their property, by the native Zoque population to the Spanish Crown (1687), followed by two phases: First phase of colonization (1780 – 1948) characterized by an spontaneous local colonization of Zoque from the central villages towards the periphery of their territory and a second phase of colonization (1950- 1995) characterized by a resource control strategy from the Zoque to occupy and defend their territory, especially the eastern region, and a governmental strategy to control and exploitation of the region natural resources , as the government promoted settlements of ejidos by displaced people from other parts of the country

(83%), followed by Los Limones (63%). San Antonio and Las Conchas have the highest percentage of non-Catholics and/or people with no religious affiliation (58% and 73% respectively) (INEGI 2000). Stakeholders interviewed and documents analyzed report that the latter two communities also have higher levels of internal conflicts and divisionism.

Vigueras (1999) points out that since its foundation, Benito Juárez has been growing and strengthening itself organizationally. When consulted about the issues inside the community, villagers recognized agrarian conflicts (with Chiapas) and forest fires as their main issues, which they considered as closely related. Community members also highlighted a lack of organization and mistrust as important internal issues that must be resolved to reach community development (Vigueras 1999). During my first trip to the community (Appendix 3), I noticed that committees were in charge of different functions that served as a support to the communal authority: school issues, Catholic Church construction, school meals, etc. The community of Benito Juárez showed itself to be well-organized. Its members recognized *“the importance of community organization and service”* (from informal conversations with community leaders). An important feature to highlight is the presence of CHUDEB A. C. (Chimalapas Unidos para la Defensa de la Etno y la Biodiversidad A. C.), an NGO that started inside the community in order to prepare projects and have access to external sources of funding.

In contrast, I observed that San Antonio seemed to have lower levels of organization (Appendix 3). There were small and isolated groups of people within the community that continuously expressed lack of trust of other community members within the meetings and assemblies and in informal conversations. Despite the efforts made by Benito Juárez's leaders, San Antonio refused to participate within the CHUDEB A.C. activities. Another point to highlight is the presence in San Antonio of a women's organization that has been attempting to get external money to fund a wildlife management project. The women's organization has the support of the communal authorities in their search for funds and external help (Appendix 3).

#### 4.4 Political Capital

According to the 1990 and 2000 general population and housing census reports (INEGI 1990, 2000), San Miguel Chimalapa has 20 reported localities (villages), which share 134,000 ha of communal lands.<sup>11</sup>

The decision-making structure in San Miguel Chimalapa has as its highest authority the community assembly or “peoples’ general assemblies” (*Asambleas Generales del Pueblo*), where decisions are made by consensus and where all the issues affecting the community must be openly discussed. Oviedo (2002) argues “Rural communities in Mexico enjoy legal rights over their territories and natural heritage, and have local statutory powers that back decisions taken by the highest community authority, the assembly of community members” (p. 5). The general assemblies in San Miguel Chimalapas communities are thus extremely important when it comes to decision making about communal natural resources management.

Peoples’ assemblies of the entire municipality are attended generally by men who have registered communal rights (including the right to vote as well as the obligation to serve in case of being elected for a position). Women’s participation is extremely limited within Chimalapas communities<sup>12</sup> and is mostly restricted to widows or those women with absentee husbands (De Teresa 1999). There are two elected municipal officials: President and Communal Property Commissar (*Comisariado de Bienes Comunes*), elected for a period of three years in a general assembly. Voting and election within the peoples’ general assemblies are guided by

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<sup>11</sup> In the Mexican rural property system there are three possibilities: 1. Private property, which is similar to private land property in the rest of the world, 2. “*Ejidos*” that is a form of collective property existing after 1910 agrarian reform. The major thrust of the reform was to give land in usufruct to those who worked it in order for them to sustain themselves (agricultural land grants for subsistence purposes when the state retained ownership), and 3. “*Communal lands*”, which is an indigenous land and resources tenure system that has its roots to pre-colonial times, and operates under rights and privileges of common access to resources by all community members. Agricultural lands are assigned to community members to be used as long as the family is actively working the land; however, under the communal system the land can not be bought or sold. In the case of San Miguel Chimalapa villages, they shared 134,000 ha of communal property, entitled by a presidential resolution of March 10 1967.

<sup>12</sup> Of the communities included in this study, San Antonio has active participation of women within assemblies. Of all the assemblies I attended, I witnessed an assembly where a woman was playing the role of the Assembly secretary and noticed that her presence was highly respected.

uses, customs and traditions in which political party affiliation and platforms are not central<sup>13</sup>.

Each village has two elected authorities: village agent or village police agent (*agente de policia municipal*) and auxiliary secretary of communal property (*secretario auxiliar de bienes comunales*). As in the municipality, the electorate in most communities is composed primarily of men, and men are consistently chosen for these positions. Each village authority is elected for a period of one year. As in the case of municipal authorities (president and communal property commissar), the election is based on customs and traditions, not political parties<sup>13</sup>, and conducted during a special local village monthly assembly. In most of the villages, the authorities' election assembly is the last assembly of the year, in December, but this is not the case of Benito Juarez which chooses its new authorities in March.

Within Chimalapas communities and villages, elected authorities never make a decision without having the support of community consensus backed up with a signed assembly act. This implies a never-ending necessity of consultation and discussion among members to endorse a resolution. Localities maintain internal political autonomy in decision-making, whereby power is informal, obeying rules that have not been accepted by the community as written bylaws<sup>14</sup> (De Teresa 1999: 57) and which (along with the authorities' rapid turn over) affects communities' political capital.

#### **4.5 Financial Capital**

Las Conchas community members' main productive activities include subsistence agriculture (mostly corn, beans and squash) and forestry activities. The main productive activities within the community of Los Limones are subsistence agriculture (corn, beans and squash) and livestock production (although some

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<sup>13</sup> Elections based on uses, customs and traditions and not political parties does not mean that people are not party affiliated (they could be), it means that at the moment of the election there is no mention of political affiliation and the process follows the traditional procedure of consensus.

<sup>14</sup> San Miguel Chimalapas community has, since year 2000, communal statutes (bylaws) that are not yet completely recognized by the community members (from the 20 villages), which argue that their opinion was never taking into account in the elaboration of the document (CHUDEB & CAPLAC 2002: 13).

members have been trying other crops- tomato, melon and watermelon- with positive results at the beginning but reported decreases in production within a period of two years, which discouraged the activity among the community). Like Las Conchas, Benito Juarez's main productive activities include subsistence agriculture (corn and beans) and forestry activities (timber and non timber forest products). Benito Juarez also reports some livestock production and small coffee plantations. San Antonio community productive activities are similar to Benito Juarez, but some members of the community have been experimenting with tomato production as an alternative cash crop. Tomatoes are a share crop with "outsider investor partners" providing capital and markets and reportedly have a high use of agrochemicals and high demands for water. Community members report specific negative health impacts, including a belief that there has been an increase in cancer in the community that is attributed to agrochemicals.

#### **4.6 Built Capital**

Benito Juarez community seems to be very well organized in terms of infrastructure. The location of houses, community buildings (school, communal house, church, etc.) and roads is clear and follows a Western or modern model<sup>15</sup>. Many of the communal buildings including some of the school classrooms, the communal house (the community agreed to use the communal house as a tele-secondary school which has the required equipment: VHS, TV and solar cells to provide solar energy), the basketball court and soccer field, are products of the collective action *tequio*. For the last four years the Benito Juarez community has been constructing a Catholic church with communal funds and support (Box 9.8). Infrastructure in San Antonio does not look as well organized and developed as in

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<sup>15</sup> The Spanish set up a specific order for their villages around a main square with the church and governmental offices which seems to be followed in Benito Juarez. Benito Juarez's main square consist of the school (with the basketball court), the communal house (where the assemblies take place), and the Catholic Church.

Benito Juarez. Maybe this could be because it is a younger community and the community is divided by the rural gravel road<sup>16</sup>.

In terms of utilities, 22% of the households in Los Limones have electricity, piped water and sewage services and just a small percentage has no services (3%). The other three communities (San Antonio, Benito Juarez and Las Conchas) have the highest percentage of households with no services at all: 10% in Benito Juarez and San Antonio and 13% in Las Conchas<sup>17</sup>. These communities are below the municipal mean of 7.7% (INEGI 2000).

#### **4.7 Natural Capital**

According to Salas et al. (2001:29-41) San Miguel Chimalapa municipality is considered a priority conservation area, as its complex interactions between topography, hydrology and climate have resulted in high diversity of flora and fauna. San Miguel Chimalapa has numerous vegetation systems: montane cloud forest, pine forest, oak-pine forest, oak forest, elfin forest, lower montane wet evergreen forest, tropical deciduous forest, chaparrera (pre-Hispanic secondary forest), fragmented and deforested areas (Figure 4.1).

Most of the issues pointed out by the community members are related to their natural capital: the basis of agrarian conflicts or forest and agricultural land productivity. During the workshop to jointly develop the community productive projects, Las Conchas, San Antonio and Benito Juarez's community representatives pointed out scarcity of water during the dry season as the main issue within the community, and highlighted the fact that water scarcity worsened after the 1998 forest fires events. The main issues that the San Antonio and Los Limones communities identified are related to healthy local production of vegetables, especially after their previous high dependence on agrochemicals to produce market oriented crops.

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<sup>16</sup> By the time I entered the project, Los Limones and Las Conchas were not longer active within GIEMPBI project. Thus I have no observations to report in reference to the community capitals, beyond the information from technical reports and secondary data (Census Reports)

<sup>17</sup> San Antonio, Benito Juarez and Las Conchas have no (0%) households with all the services, compared with 20% of total households in San Miguel Chimalapa



As indicated in the previous paragraphs, the modernization process within Chimalapas communities is manifested through the capitals that have been affected by it in different degrees. Within the pilot communities, the most important issues comprise human, natural, financial and built capital (and the effects of modernization process). Political, social and cultural capitals also show the effects of the modernization process (though to a lesser degree) and the expressions of community resilience and adaptation to growing changes. The next chapter will address specifically the effects of the 1998 forest fires on the community capitals, demanding responses from all sectors of society and bringing along unintended consequences.

## CHAPTER 5. FOREST FIRE EFFECTS ON COMMUNITY CAPITALS: “THE DOMINO EFFECT”

In this chapter, I present my findings on how the 1998 forest fires affected not only communities' natural capital, but also the rest of the community capitals: “the domino effect” (Table 5.1). I begin the chapter with an overall analysis of the post fires period and in the following sections I present a description of the national (federal), regional and local contexts where the modernization process triggered by the fire events took place and the specific capitals that the process affected.

The 1998 alarming forest fire events in the Chimalapas region drew the attention of local, regional, national and international communities. The region had the highest number of forest fire events in the state of Oaxaca: 92 fires reported in San Miguel Chimalapa and 89 in Santa Maria Chimalapa, and the largest affected areas, 62,899 ha in San Miguel Chimalapa and 185,355 ha in Santa Maria Chimalapa (Figure 5.1). This type of catastrophic ecological disturbances moved local rural communities from being “at the end of the world” to be “in the eye of the hurricane” (Arizpe et al. 1996).

GIEMPBI and other national and international NGOs and state agencies utilized a study conducted by Society for the Study of Oaxaca Biotical Resources, Civil Association- SERBO, *Sociedad para el Estudio de los Recursos Bióticos de Oaxaca, Asociación Civil*<sup>18</sup>, as a justification and starting point for a series of projects to evaluate the ecological impact of the 1998 forest fires. SERBO studies were basically botanical inventories and an evaluation of the ecological impact of the 1998 forest fires using Geographic Information Systems.

The ecological situation documented by SERBO was disastrous and attracted the attention of state and civil society actors. After the fires, environmental and social

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<sup>18</sup> SERBO A. C. is an Oaxacan NGO that worked in the Chimalapas region and faced serious accusations of providing governmental instances with maps to the establishment of conservation areas, extraction of plant material for biodiversity analysis and bioprospection, and lack of communication with the communities.

effects were felt especially at the local level, in terms of shrinking natural and social capitals within the communities. e.g., water scarcity and growing distrust. As mentioned in an interview with a staff member from an international NGO, local communities felt threatened by the situation imposed by the forest fires thus making them more willing to participate in projects to heal the damage and prevent a new threatening situation (Figure 5.2).

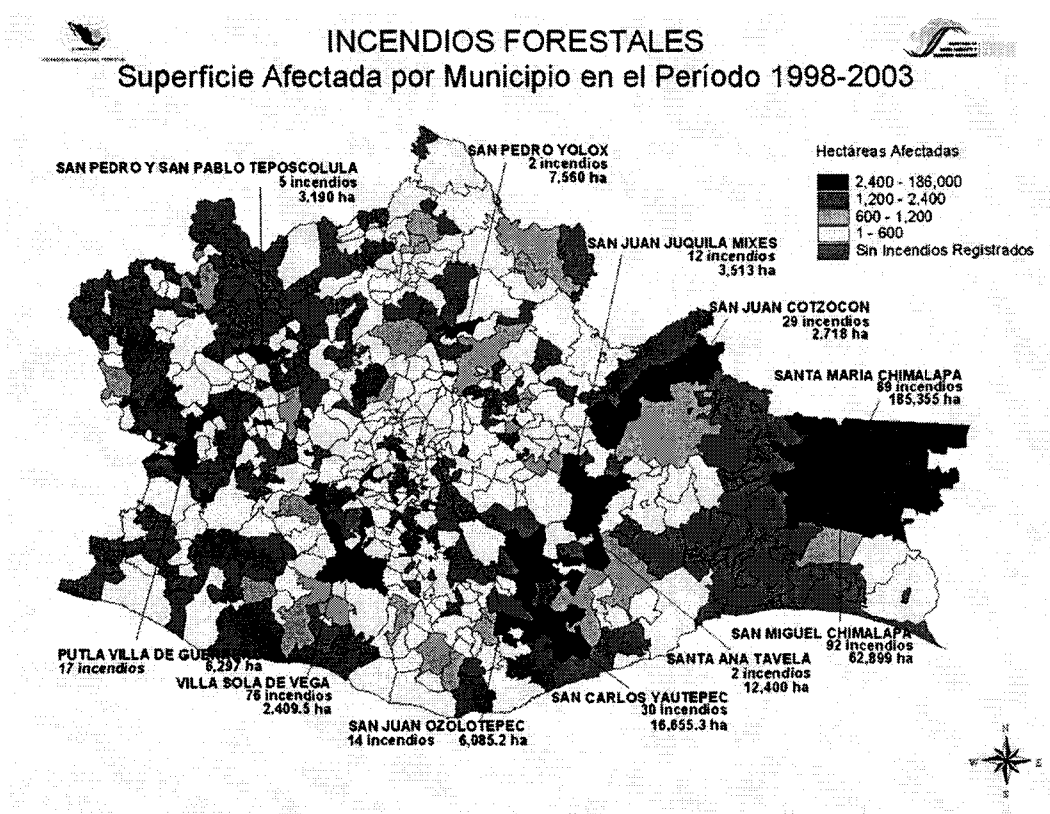
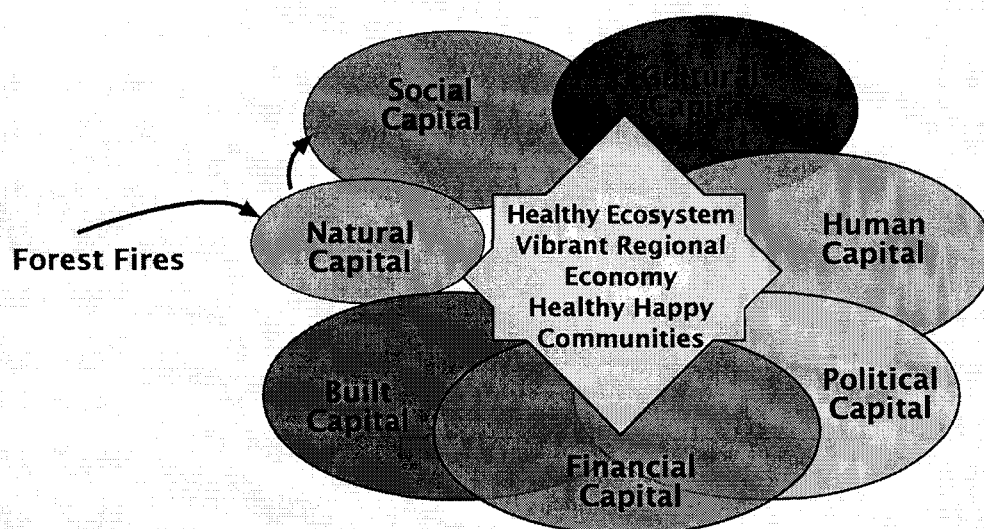


Figure 5.1 1998- 2003 forest fire events affected areas (ha) (SEMARNAT/CONAFOR)

People from the communities felt threatened, but also they were able to see the connection between the health of the forest and their wellbeing, as these remarks from a man in one of the Chimalapas communities indicate.

Here we all know, from the oldest to the youngest, that if the forest fire continues, we all are going to disappear...not just the forest vegetation. The fire is not good; on the contrary, we are destroying not only the trees, but

ourselves as well, because the day will come that we are not going to have water. There will not be rain, and how will we take care of ourselves then? *Aquí todos nos damos cuenta, desde los mas grandes hasta los mas chiquitos, que si los incendios siguen, aquí todos nos vamos a acabar, no solo la vegetación de la montaña. Que el incendio no es beneficio, sino que nos estamos acabando, no sólo los arbolés y así nosotros también porque va a llegar el día que no ya va a haber agua, ya no va a haber lluvia y de donde nos vamos a mantener* (S. Mature male from S.A. participating in a focus group to evaluate GIEMPBI project. March 2004)



**Figure 5.2 Effects of forest fire events on Chimalapas Communities: shrinking natural capital**

During interviews with various key stakeholders, they mentioned that in 2000, when the ecological projects started to analyze the impact of the forest fires, there was growing distrust among communities, governmental institutions and NGOs as well as a high degree of tension within the communities due to escalating agrarian and territorial conflicts. They also mentioned that these conflicts were highly aggravated by the forest fire events (growing distrust). All the different sectors affected by the fire events, whether directly (the communities) and/or indirectly (institutions and other communities), were quick to make accusations and place blame. "They started blaming each other" "*Se empezaron a culpar unos a otros*" (Interview with a female agronomist working as a consultant for the communities. June 2003). This conflict further widened the preexisting distrust and showed how

the imbalance in natural capital was exacerbating a previous imbalance in social capital (Figure 5.2). One member of an international NGO in response to the question about the reasons to accept external researchers describes how Chimalapas communities reinforced their social capital (bridging and linking social capital) with outsiders.

In the local context there was a growing distrust from the communities towards different institutions and different levels of conflict within the communities due to territorial and agrarian conflicts. SERBO prepared an initial assessment related to the impact of the forest fires. The ecological situation presented in these results was alarming. The effects and problems after the forest fires were felt at the local level. There was no water. By the first time, communities' people felt directly threatened by the situation and openly manifested willingness and openness to participate in projects to heal and prevent the situation.

*En el contexto local existía una desconfianza creciente de las comunidades hacia las diversas instituciones y diferentes grados de conflicto a lo interno de las comunidades por problemas de orden territorial y conflictos agrarios. Se tenía un análisis inicial preparado por SERBO con respecto al impacto de los incendios forestales. La situación se presentaba alarmante. Los efectos y problemas posteriores a los incendios se sentían a escala local. No había agua por ninguna parte. Por primera vez la gente de las comunidades se sintió directamente amenazada por la situación y manifestó la disposición y anuencia a participar en proyectos para remediar y prevenir la situación* (male staff member of an international NGO working in Oaxaca. June 2003).

Likewise, fire events affected the communities' human capital. Men from the two communities involved in the voluntary fire fighting brigades developed respiratory problems and other health complications, due to the extended and strenuous labor days and the harsh conditions. Health issues within the communities were aggravated by the lack of governmental support in form of appropriate equipment and monetary assistance (Ament 1999).

Communities' cultural and political capitals were also severely affected by the 1998 fire events. Communities resented the presence of outsiders such as researchers, governmental and non-governmental officials within the communities' decision-making structure (Ament 1999, CHUDEB and CAPLAC 2002). Research institutions and NGOs initiated projects with the goal of helping to understand the

ecological impact of the forest fires (e.g., SERBO A.C.<sup>19</sup> and PRONATURA<sup>20</sup> Chiapas). However they were accused by community members of being directly involved in the promotion of an ecological reserve on lands belonging to the communities.

In addition, financial and built capitals were affected by the unusual fire events. Due to the urgency of responding immediately to the fires, men from the nearby communities stopped their agricultural and productive activities and voluntarily joined (as mentioned above) the fire fighting brigades (Ament 1999). Once the fires were controlled, water scarcity in the region aggravated the poor agricultural yields and affected the livestock production because of dry pastures. Further, community members dependent on forestry activities (timber and non timber products) were also negatively affected “due to the vast forest areas burned, they were unable to provide for their families” (from informal conversations with a carpenter in one of the communities, June 2002).

**Table 5.1 State of the community capitals at the post forest fires period.**

<b>Natural</b>	Extensive and severely burned areas with subsequent deforestation and reported water scarcity
<b>Social</b>	Growing distrust, disruption of communications of communities with outsiders
<b>Cultural</b>	Presence of outsiders bringing new demands for community response
<b>Human</b>	Greater incidence of health problems due to forest fires. Out migration as a possibility among young men
<b>Political</b>	Attempts (by state agencies and NGO's) to impose a nature reserve on communal lands which will affects communities' decision making over their natural resource management
<b>Financial</b>	Family income affected due to poor pastures and lack of water for irrigation
<b>Built</b>	Problems with the access roads due to the unusual traffic (brigades trucks and other vehicles)

<sup>19</sup> Society for the Study of Oaxaca Biotical Resources, Civil Association (*Sociedad para el Estudio de los Recursos Bióticos de Oaxaca, Asociación Civil*)

<sup>20</sup> PRONATURA A.C. is a Mexican Non Profit Civil Association devoted to the promotion of the conservation of natural resources in the country. The closest program of PRONATURA in Oaxaca is the Chiapas program, where along with other GOs and NGOs, they promoted the establishment of conservation areas, creating resentment and distrust from Chimalapas communities

The unusual situation faced during and after the 1998 forest fires brought forces of modernization into the communities, starting with the disruption of and threat to natural capital (Figure 5.2), which had a subsequent impact over the rest of the community capitals (Figure 5.3, Table 5.1), causing the communities' already precarious capitals to become even more imbalanced. That, in turn, required community action to recover community health by reconfiguring the community capitals. There is an extensive literature that shows that bonding community capital increases as a result of a threat, which can then lead to an increase in bridging social capital (Flora et al. 2004, Fukuyama 2001, Granovetter 1973, Narayan 1999).

Centralization was instituted to fight the forest fires, and the local communities resented the fact that there was not a larger government fiscal presence to provide salary and supplies to the local fire fighters. External agents, including researchers from educational institutions and officials from governmental and non-governmental organizations, interested in the ecological and social impact of these unusual fire events, directly influenced modernization forces (bridging social capital and political capital). While this seemed unrelated to modernization, in fact their presence required substantial shifts in control of key community capitals (natural and political among others), moving the locus of control outside the community. Much of the reactive bonding social capital that occurred can be conceptualized as a response to the threat of these unintentional forces of modernization, which included Habermas' (2003) drivers of technology of communication, scientific knowledge, production and transportation.

Forest fire events were triggers for action, not only from the communities that were directly affected, but also for different national and international levels and sectors of society, including participation of the US Forest Service in fighting the fires with major equipment and personnel. This process is consistent with Habermas' (1987, 1990) definition of modernization as a process involving all sectors in society. The massive intrusion of outsiders and their institutional base destabilized social capital (huge increase in the importance of having specific external contacts outside the usual patronage system), financial capital (some local people received new

sources of income as a result of participating in the various projects and some did not) and political capital (local governments suddenly had to form new agreements and contracts with the outsiders).

The 1998 forest fires placed an undeniable risk on all stakeholders requiring immediate action, as suggested by risk theorists (Beck 1999:135). Instead of reacting to the past (reactive), people are acting in response, in advance, to an uncertain future (proactive). Thus, in turn, concerns about losing control to a centralized eco-reserve were used by local actors to increase bonding social capital, responding to the threat to the existing order due to the increase in bridging social capital. The risks perceived were not just the loss of natural capital to fire, but also the loss of access to and control of natural capital to outside institutions (political capital).

After 1998, actions were based on the uncertain possibility that severe forest fires could occur again, with all the consequences (risky events) that the 1998 forest fires brought into the Chimalapas at the community and regional level. Both the perceived risk after the adverse effects on natural capital (and the risk generated by the introduction of scientific knowledge and technologies) and the consequences of the interactions with researchers and officials from governmental and non-governmental organizations forced by the 1998 events, placed even greater demands on the state (and its agencies) for control.

Communities have to respond to the perceived outside threats. One response would be to simply cease to exist as a functioning community, should both bridging and bonding social capital become completely individualized. Another possible response was to reconstruct social capital (bonding, bridging and linking social capital) in order to re-balance and recover synergy of the community capitals. The municipality of San Miguel Chimalapas proved willing to increase bridging social capital by initiating (allowing) participatory research with outsiders including research institutions, governmental and non governmental organizations (bridging and linking social capital) and within villages in the Municipality (bonding social capital) (Figure 5.3) (see Chapter 7). In contrast, the municipality of Santa Maria Chimalapa, equally



devastated by the fires, tightened its boundaries and did not allow research projects to enter the area.

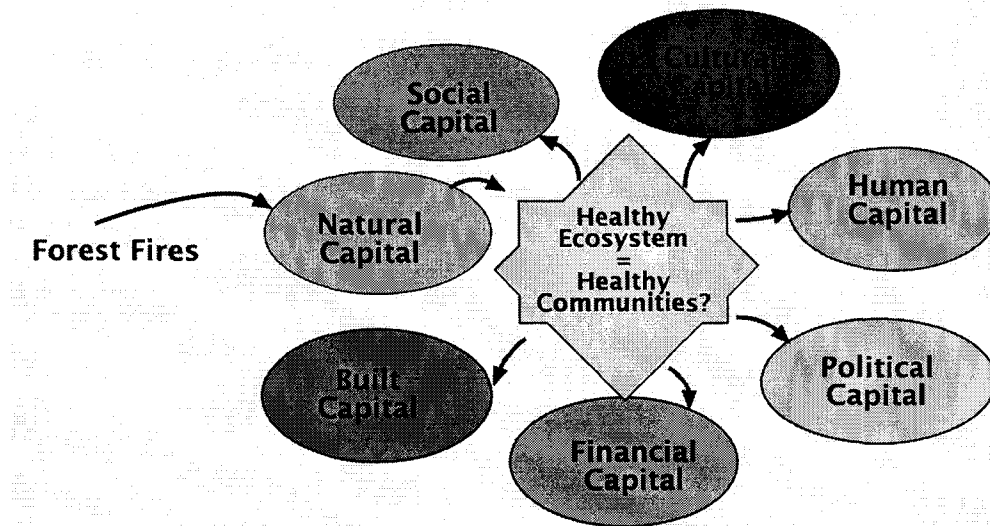


Figure 5.3 Effects of forest fire events on community capitals: the domino effect

### 5.1 National/Federal Context

In the national/federal context the modernization process triggered by the fire events was related specifically to political capital. This political capital has had repercussions on the relationship between state agencies and the services provided to and demanded by Chimalapas' communities.

#### 5.1.1 Political Capital

After the forest fire events of 1998, the institutional and political situation at the national level was extremely uncertain. Mexico was facing a change in the ruling political party, as the National Action Party<sup>21</sup> (*PAN Partido Acción Nacional*) defeated the Revolutionary Institutional Party<sup>22</sup> (*PRI Partido Revolucionario*

<sup>21</sup> Founded in 1939, PAN was the first and main conservative opposition party in Mexico against nationalizations and land reforms led by PRI after Mexican revolution. PAN has strong support from business sector of Mexican society.

<sup>22</sup> The PRI had been in power since the Mexican revolution.

*Institucional*) in national elections. This brought changes, restructuring and reorganization in society, as well as in the various federal and state agencies with responsibilities for developing and implementing programs that promote community development and land use management in the Chimalapas region.

### **5.1.2 Political Capital and Federal Institutional Structures**

The panorama seems chaotic at the national level as a party other than PRI comes to power for the first time in 73 years. The new government makes lots of adjustments and restructuring of government agencies. Secretariats get restructured and new agencies are created, among them CONAFOR (National Forest Commission- Comisión Nacional Forestal). The new secretary of the environment does not understand the environmental issues of the country. This secretariat, with few years of existence, has set precedents and guidelines for the sustainable management of country's natural resources. The new secretary radically changes actions and policies related to the environmental agenda.

*El panorama en el ámbito nacional se veía caótico: cambio de gobierno a un partido ajeno al PRI por primera vez en 73 años. El nuevo gobierno viene con muchos reajustes y reestructuración al nivel de instancias gubernamentales. Las secretarías se reestructuran y aparecen nuevas dependencias, entre ellas la Comisión Nacional Forestal CONAFOR. En la secretaria de medio ambiente, es nombrado un secretario ajeno a los asuntos ambientales del país. Esta secretaria con pocos años de formada, había sentado precedentes y marcado pautas para el manejo sustentable de los recursos naturales del país. Con la entrada del nuevo secretario se cambian radicalmente las acciones y políticas respecto de la agenda ambiental (Interview with a male staff member of an international NGO working in Oaxaca. June 2003).*

Overall responsibility for the environmental regulatory framework rests with the Secretariat of Environment and Natural Resources- SEMARNAT (*Secretaría de Medio Ambiente y Recursos Naturales*), formerly Secretariat of Environment and Natural Resources and Protected Areas, SEMARNAP (*Secretaría de Medio Ambiente, Recursos Naturales y Areas Protegidas*). SEMARNAT includes three under-secretariats. The under-secretariat for regulatory matters related to the environment (*Sub-Secretaría de Fomento y Normatividad Ambiental*), the under-secretariat for environmental planning and environmental policy (*Sub-Secretaría de Planeación y Política Ambiental*), and the under-secretariat for environmental

protection (*Subsecretaría de Gestión para la Protección Ambiental*). SEMARNAT also includes some deconcentrated agencies:

- The federal delegations<sup>23</sup> (*Delegaciones federales*)
- The regional coordinating offices
- An enforcement branch, the Attorney General's Office for Environmental Protection, PROFEPA (*Procuraduría Federal de Protección Ambiental*)
- The protected areas management commission- CONANP (*National Commission for Protected Areas*)
- The National Water Commission, CAN (*Comisión Nacional del Agua*)
- A research institute, National Institute of Ecology, INE (*Instituto Nacional de Ecología*).

And two decentralized agencies:

- The Mexican Institute for Water Technology, IMTA (*Instituto Mexicano de Tecnología del Agua*), responsible for all aspects of water management, irrigation, planning and infrastructure, as well as research and development of treatment facilities, dam security, etc.
- The National Forest Commission- CONAFOR (*Comisión Nacional Forestal*), which promotes forest ecosystem management through conservation, protection, and investment activities report administratively to SEMARNAT (Figure 5.4).

In addition to SEMARNAT, there are other federal agencies with strong political influence on natural resource management in the Chimalapas region:

- The National Commission for the Knowledge and use of Biodiversity, CONABIO (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*), is an autonomous government entity under a technical committee comprised of representatives of all the various government branches related to environment, is responsible for research and scientific recommendations on conservation of biological diversity in Mexico.

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<sup>23</sup> State offices

- The Secretariat of Agriculture, Livestock, Fisheries and Food, SAGARPA (*Secretaría de Agricultura, Ganadería, Pesca y Alimentación*) has overall responsibility for promoting and managing agricultural and rural development, fisheries, and food production, supporting both smallholders and large-scale producers. SAGARPA coordinates a number of programs and services, including extension, farming systems research, marketing and distribution, and promotion of alternative and sustainable practices to avoid fire use for agricultural activities.
- The Secretariat for Social Development, SEDESOL (*Secretaría de Desarrollo Social*), is responsible for social development and through its delegations (or state offices) and programs, for the welfare of rural and marginalized communities.
- The Secretariat of Land Reform, SRA (*Secretaría de la Reforma Agraria*) is responsible of land tenure issues including conflict resolution and has been key in the process of communal statutes and by-laws within the Chimalapas Communities.
- The National Commission for the Development of Indigenous Peoples, CDI (*Comisión Nacional para el Desarrollo de los Pueblos Indígenas*) (Formerly Instituto Nacional Indigenista INI), is a decentralized and autonomous federal public entity, is responsible for guidance, coordination, promotion, support, encouragement, follow up and assessment of programs, projects, strategies and public actions for the sustainable and integrative development of indigenous communities in Mexico.

The latter two secretariats and CDI are the major institutional actors with which Chimalapas region communities must associate. The communities must rely on these agencies for help in the resolution of the agrarian conflict and the promotion of social development programs and projects. These agencies are also key in the policy making process that supports local and regional efforts as conservation of the Zoque communal lands and natural resources.

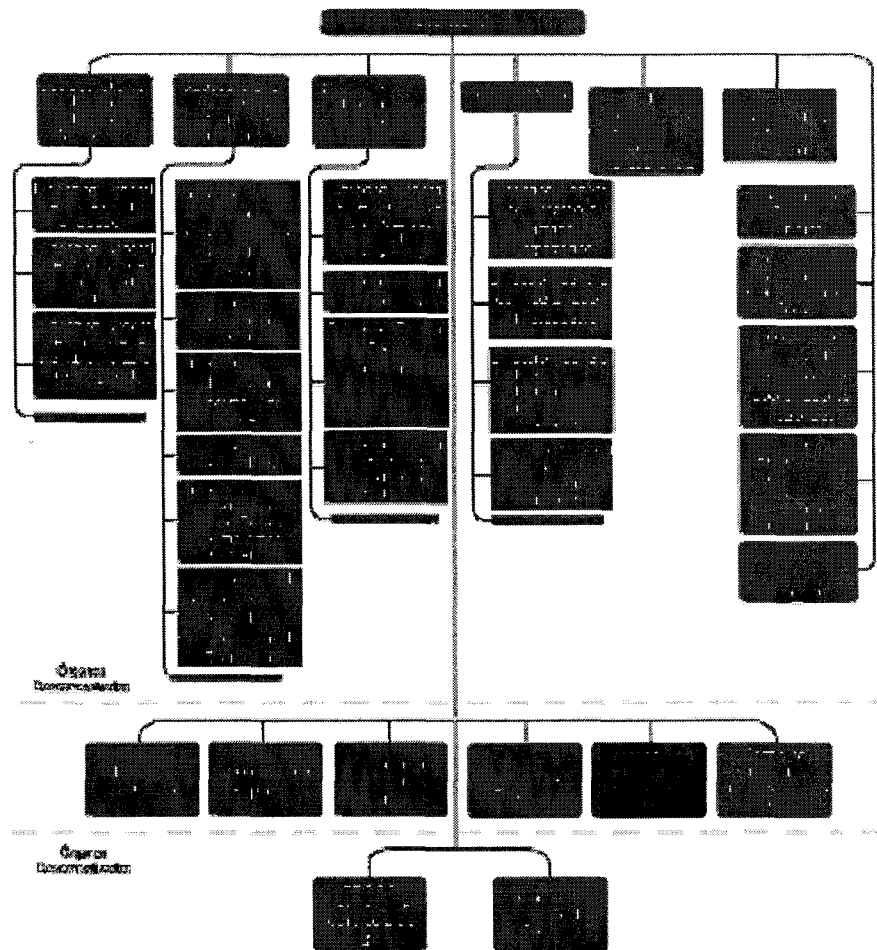


Figure 5.4 SEMARNAT organic structure<sup>24</sup>. (From SEMARNAT n.d.)

## 5.2 Regional/ State Context

The modernization process has had implications for political and social capital at the regional/state level. Response from the Oaxacan state agencies impacts relationships with rural communities (social capital) leading to a disruption of communication and the presence of growing mutual distrust.

<sup>24</sup> "The organic structure comes from the agreement to which administrative units and deconcentrated and decentralized organs of the Secretariat of Environment and Natural Resources subscribe, published January 27 2003. *La estructura orgánica emana del Acuerdo por el que se adscriben orgánicamente las unidades administrativas y órganos desconcentrados de la Secretaría de Medio Ambiente y Recursos Naturales, publicado el 27 de enero del 2003.* SEMARNAT n.d.

### 5.2.1 Political Capital

The state of Oaxaca remains firmly in the PRI camp, although factions of the party battle bitterly at the local level. This results in increased suspicion of the federal government and its avowed intent to replace the traditional patronage system in the distribution of federal resources.

### 5.2.2 Political Capital and State Institutions

All the above mentioned federal government agencies have agreements with state level government entities to implement their programs. In forestry, the state level entity is the Secretariat of Agricultural and Forest Development (*Secretaría de Desarrollo Agropecuario y Forestal*, SEDAF). The Oaxaca State Institute for Ecology (IEEO) is responsible for regulations related to environmental issues, including the process of formulating and achieving consensus regarding the communal statutes (bylaws) in both San Miguel<sup>25</sup> and Santa Maria Chimalapa Communities. The Attorney General's Office for Land Reform (*Procuraduría Agraria*) is involved in facilitating negotiations to resolve agrarian conflicts over state and municipal boundaries, and along with IEEO supports the communal statutes within Chimalapas communities<sup>26</sup>. Finally, municipal governments (San Miguel and Santa Maria Chimalapa) are responsible for implementing environmental regulations at the local level, as established by the Ecological Balance and Environment Protection General Law, LGEEPA (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*), the principal environmental law in Mexico.

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<sup>25</sup> San Miguel Chimalapa has a communal bylaws (statutes) document inscribed in the National Agrarian Register on June 16 2000. Although in the region there is still a lot of discussion about applicability and validity of the document, stakeholders interviewed consider it a first important step to set the bases for social, economic and productive development of the community.

<sup>26</sup> IEEO, SEMARNAP, PROFEPA and WWF, under the coordination of the Attorney General's Office for Land Reform (*Procuraduría Agraria*), collaborated with San Miguel Chimalapa Communities, facilitating workshops and giving legal assistance, in the formulation of the above-mentioned San Miguel Chimalapa Communal bylaws. Many of the laws included are related to decision-making about land and natural resource use.

### 5.2.3 Social Capital

After the 1998 forest fires, the regional situation and institutional coordination were very difficult, not only because of the unusual fire events that demanded immediate and effective response from the institutions<sup>27</sup>, but also because of the communities distrust of governmental agencies. In 1999 there was a governmental initiative to establish ecological reserves, Biosphere Reserves. The federal government, Secretariat for the Environment, Natural Resources and Protected Areas, SEMARNAP, and international conservation agencies, led this initiative. In the year 2000, due to the unclear objectives and the top down approach of these proposed protected areas, there was a disruption of communications between communities and outside organizations. The effects of disrupted communication is captured in the words of an interviewee

This disruption of communications exacerbated the growing distrust within the communities towards external institutions (governmental and non governmental) as well as an institutional distrust towards the Chimalapas region.

*Esta ruptura de comunicaciones acrecenta la desconfianza de las comunidades hacia las instituciones gubernamentales y no gubernamentales y de las instituciones hacia los Chimalapas* (personal communication, male staff member of an international NGO working in Oaxaca. June 2002).

That same year, 2000, Chimalapas-GIEMPBI project for the participatory study of forest fires impacts was positioned by its leaders as a liaison between communities and external organizations. Some federal agencies and their state affiliates and non-governmental organizations expressed interest and acted proactively in working with natural resource management in the Chimalapas region after the 1998 forest fire events. WWF Oaxaca, SEMARNAT, the National Forest Commission (CONAFOR), and Program for Conservation and Sustainable Management of Forest Areas (PROCYMAF), became important institutional links within the Chimalapas-GIEMPBI project. A new external and neutral organization,

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<sup>27</sup> Budget shortages are common at the federal/ secretariats level as well as at the state and local level. This situation is expected to improve under the decentralization program currently in process which supposedly will transfer expanded functions and more funds to the state and local level.

(GIEMPBI) without a long-standing local history, served in many ways as a broker for the negotiations between communities and outsiders to initiate projects aimed at understanding the ecological and social effects of the unusual fire events.

At the regional level there was general institutional distrust of the Chimalapas communities ... and vice versa. There was a coincidence of communitarian and institutional interest in the development of strategies to recover after the fires. Communities and institutions jointly started a series of projects including opening fire breaks, establishing of control towers, cartographical studies, following up risk spots, soil conservation initiatives and reforestation plans.

*A nivel regional era general la desconfianza institucional sobre los Chimalapas ... y viceversa. Existía la coincidencia de interés, tanto comunitario como institucional, en desarrollar estrategias para recuperación después de los incendios. Conjuntamente, entre las comunidades y las instituciones se puso en marcha un ciclo de proyectos incluyendo: Apertura de brechas cortafuegos; establecimiento de torres de vigilancia; estudios cartográficos; seguimiento a sitios de riesgo, tareas de conservación de suelos; planes de reforestación.* (Interview with a male Oaxacan anthropologist, June 2003).

Regionally, at the beginning of the Chimalapas project, the [ecological and political] situation was pathetic. Since 1999 there was a proposal backed by the President of the Republic, SEMARNAP, and WWF to promote a zone of sustainable forest management and community-protected areas in the Chimalapas region. The idea was to open communication channels between federal government and state level government. In 2000, negotiations stopped and there is a growing distrust among the community.

*En el ámbito regional, al iniciar el proyecto la situación se presentaba patética. Desde 1999 existía la propuesta, respaldada por la presidencia de la República, SEMARNAP y WWF, de promover en la zona un manejo forestal sostenible y áreas de protección comunitarias. La idea era abrir canales de comunicación entre el gobierno federal y el gobierno estatal. En el año 2000, las negociaciones se suspenden y se empieza a dar una desconfianza creciente entre la comunidad* (Interview with a male staff member of an international NGO working in Oaxaca. June 2003).

### 5.3 Local/Communities Context

At local level, the modernization process initially had repercussions over financial, social and political capitals. However, this initial effect has had an impact on all the community capitals, which I term the domino effect.



### 5.3.1 Financial capital

According to key informants and the Vocalía Ejecutiva de los Chimalapas document “Tequio por Chimalapas” (ND) important investments from governmental and international sources, mainly DFID UK and WWF in social development projects in the highly marginalized Chimalapas region communities began in 1989, but as said in the interviews “Those resources were managed by technical teams and never reached the people” *“Esos recursos fueron manejados por los técnicos de las organizaciones y nunca llegaron al pueblo”* (Interview with a community leader, July 2004).”

### 5.3.2 Financial, Social and Political Capitals

Despite the efforts of the various organizations active in the region to make truly participatory projects, those projects followed the top-down development approach (paternalistic and clientelistic approaches) well-known in the region.

Beginning in 1989 the federal government and international agencies invested resources for social development in the Chimalapas. Technical teams managed the resources and there was not a clear methodology or a process to include the communities or to make a participatory project to achieve community empowerment and the needed development. Maderas del Pueblo del Sur-Oeste, MPS<sup>28</sup> appeared in the early 90s on the scene with a highly participatory vision and mission<sup>29</sup>, but unfortunately, personal interests cancelled out initial practical successes. MPS’ impact was essentially in building the capacity of a few key community members.

*Desde 1989 se invirtió mucho recurso en Chimalapas para el desarrollo social. El recurso era manejado por equipos técnicos y no existía una metodología clara para incluir e incorporar a las comunidades, y juntos desarrollar proyectos realmente participativos para empoderar a las comunidades y lograr el desarrollo tan necesario. En la escena de los Chimalapas aparece Maderas del Pueblo del Sureste (MPS) con misión y*

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<sup>28</sup> MPS a Non-Governmental Organization (NGO) was created in Oaxaca by a group of local intellectuals interested in formulating development projects within Chimalapas communities (accessing DFID UK and WWF funding). MPS had high levels of political involvement and political conflict (within the organization as well as with the communities), which ended in its ‘diaspora’ and later disappearance, leaving behind distrust and resentment from the communities of any external organization.

<sup>29</sup> MPS’s mission was “to provide community based development and extension assistance under the aegis of sustainable resource use and conservation of the reserve”(Russell and Lassoie n.d.:1)

*visión muy participativas, pero infortunadamente intereses personales desvirtuaron la práctica inicial. El impacto de MPS fue esencialmente el desarrollo de capacidades de algunos comuneros, elementos muy puntuales dentro de la comunidad (Interview with a male Oaxacan anthropologist, June 2003).*

MPS's impact is indeed contradictory. On the one hand they built capacity with small groups of community members being mentioned as highly selective, targeting natural leaders in some of the villages with whom they worked, especially within the eastern communities in San Miguel Chimalapa and Santa Maria Chimalapa Municipalities. On the other hand MPS reinforced the communities' distrust of outside entities, as the communities constantly accused MPS of providing inequitable access to project benefits. Governmental agencies charged MPS with lack of transparency and accountability. In both communities and governmental agencies MPS's experience raised reservations of social development projects managed by NGOs. This general distrust appeared several times during interviews and informal conversations with key informants and community members.

By the end of 2000 and the beginning of 2001, active members of three villages from San Miguel Chimalapa eastern region, La Cristalina/5 de Noviembre, Sol y Luna and Benito Juarez, initiated the formation of a community NGO. The commitment to form an NGO can be seen as community organizational capacity to create bridging and bonding social capital. With support from WWF (linking social capital), community members conducted participatory workshops in the villages. On March 5 2001, CHUDEB A. C.: Chimalapas United in Defense of Ethno and Biodiversity, Civil Association (*Chimalapas Unidos para la Defensa de la Etno y la Biodiversidad, Asociación Civil*) was registered as a legal entity.

In 2001 there was interest in the region in forming a civil association (CA) with the goal of obtaining resources for the development of the communities. CHUDEB is a response to the presence and effect of MPS, because it was an example of how resources could be obtained in an organized way, through a CA.

*En el 2001, se empieza a gestionar en la región el interés de conformar una Asociación Civil (A.C.) con el ánimo de acceder a recursos para el desarrollo de las comunidades: CHUDEB es una respuesta a la presencia y efecto de MPS, pues se presenta como un ejemplo de que los recursos se pueden*

*acceder de manera organizada, a través de una A. C.* (Interview with a male Oaxacan anthropologist, June 2003).

In a document presented by CHUDEB A.C. with technical support from Communitarian Training and Planning, A.C., CAPLAC A.C. (*Capacitación y Planeación Comunitaria A. C.*) and funds from WWF Oaxaca<sup>30</sup>, CHUDEB highlights that organizations and agencies operate in the Chimalapas region without proper acknowledgement of local political capital. Communities are thus reasserting bonding social capital in the face of increasing bridging and linking social capital. CHUDEB also accused most organizations and agencies with direct and indirect presence of preparing and executing programs without active participation of the communities, therefore not representing communities' interest (p.12). As an example, the CHUDEB (2002) document mentions the SEMARNAT intent to impose a Biosphere Reserve without consulting communities with legal communal property rights. The document highlights the communities' shared interest in the conservation of natural resources, but emphasizes that, negotiating a conservation area could only result from a process of participatively definitions, principles and mechanisms of management. The intent of imposing a reserve area without active participation from the communities and the subsequent harmful effect on the relationship between communities and outsiders is mentioned in the interviews with several key stakeholders (staff members from national and international NGOs and community members).

The CHUDEB & CAPLAC (2002) document highlights issues and solutions related to community capitals. Table 5.2 summarizes my interpretation of the relationship among the issues and solutions mentioned within the CHUDEB document using the Community Capitals Framework.

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<sup>30</sup> CHUDEB A. C. and CAPLAC A.C. 2002. "Integrative Development Plan of Chimalapas Eastern Zone"

**Table 5.2 Interpretation of issues and solutions related to community capitals based on CHUDEB & CAPLAC (2002) document.**

<b>Community Capitals</b>	<b>Issues</b>	<b>Goals/ Solutions</b>
<b>Natural</b>	Forest fires (p. 19) Unsustainable agricultural production (p.19)	Care for wildlife and natural resources for present and coming generations To avoid forest fires through an efficient program of prevention and control San Miguel and Santa Maria Chimalapa become an area of conservation and sustainable management of natural resources. Organic agricultural production Collective sustainable management of resources (Pp.19, 20, 23)
<b>Social</b>	Incipient formal coordination and organization (community organizational capacities) (p.12) Lack of trust, agrarian conflict (bonding and bridging social capital) (p.18) Minimal institutional presence (bridging and linking social capital) (p.12)	Find a solution to agrarian conflict (Pp.18, 24) Importance of organization within Chimalapas communities to promote and reach the shared objectives (Pp.12 18, 21, 24)
<b>Human</b>	Insufficient access to education (p.18) Out-migration (p.19)	Capacity building within communities. Promotion of professional people from within the communities Promotion of different aspects of quality of life (education, health, food, security, and wellbeing) to avoid migration (p. 19)
<b>Cultural</b>	National Institute for Indigenous Affairs (INI) (supposed to have a fundamental role in the defense of culture and indigenous rights) has no contact and presence in the Chimalapas region	Preservation of heritage and identity (indigenous and non indigenous) within the region (p. 19) Reinforcement of peoples assembly's as the main decision making structure (p.21)
<b>Political</b>	Lack of support from the Attorney General's Office for Environmental Protection- PROFEPA; had not followed up the legal processes on the communities' complaints about illegal logging (p.12) Communal bylaws made by IEEO and the Attorney General's Office for Land Reform without consulting communities, reason why existing statutes are not recognized among communities (p.12) Lack of legal support from the Attorney General's Office for Land Reform ( <i>Procuraduría Agraria</i> ) for the understandings that communities have made with neighboring <i>ejidos</i> to solve the agrarian situation (p.12)	Reinforcement of peoples assembly's as the main decision making structure (p.21) Communities organized to defend peoples rights (Pp.19, 24) Promotion of community bylaws (Pp.21, 24) Contact with various governmental agencies to demand community rights (Pp.21, 24)
<b>Financial</b>	Limited presence of SAGARPA, within the communities (small number of beneficiaries) promoting not sustainable projects (natural capital) (p.12)	Importance of a revolving fund to support community initiatives (p.19) Improve economic situation of Chimalapas families (p.19)
<b>Built</b>	Inadequate infrastructure (housing, health, education and communication) (Pp. 18, 22)	Improvement of existing infrastructure (Pp.21, 25) Improved production and marketing chain for agricultural products (Pp.19, 22)

In the introductory pages, the CHUDEB document explicitly states that their goal is to work with the rest of the communities within the Chimalapas region, as well as with the institutions/organizations interested in the sustainable development of the Chimalapas communities.

This document is presented to the eastern communities, municipality and Chimalapas' people, that it might serve as the base for each one of the communities to express its interests and join this effort to conserve nature, and, as part of it, the indigenous and peasant communities that inhabit "Los Chimalapas".

*El presente documento se presenta al resto de las comunidades de la región oriente, al municipio y al pueblo de los Chimalapa, con el objetivo de que sirva de base para que cada una de las comunidades exprese sus intereses y se suman a este esfuerzo que busca en primer lugar la conservación de la naturaleza y como parte de ella, las comunidades indígenas y campesinas que habitamos en 'Los Chimalapas' (CHUDEB & CAPLAC 2002:2).*

It is also presented to the governmental and non-governmental institutions truly committed to socially just and ecologically sustainable development, so that the initiatives and interests of Chimalapa communities and be the base to which institutional resources can be directed and programs and high priority strategic projects formulated for the development of the region.

*Se presenta también a las instituciones gubernamentales y no gubernamentales que tengan el interés real de comprometerse para un Desarrollo socialmente justo, y ecológicamente sustentable, con el objetivo que sumen sus esfuerzos para lograr que las iniciativas e intereses de las comunidades Chimalapa sean base para orientación de recursos institucionales, así como para la formulación de programas, proyectos prioritarios y estratégicos para el desarrollo de la región (CHUDEB & CAPLAC 2002:3).*

In this chapter, I presented the turbulent context after the 1998 forest fires at the national, state and local levels. This turbulence, and efforts by government and civil society groups to overcome it, contributed to the distrust between the communities and the outside, as well as to conflict within the communities. I presented the setting in terms of capitals at various levels to understand the responses to the 1998 forest fires in the Chimalapas region and the subsequent domino effect on the community capitals. In the following chapters an analysis of the response of the different stakeholders is offered as well as the effects these responses have on the overall community health (spiral up or spiral down).

## CHAPTER 6. RESPONSE FROM THE STATE TO FOREST FIRES AND EFFECTS

The first institutional response of the state was to extinguish the forest fires. To control the unusual fire events, governmental agencies mobilized “official brigades” (from distant regions of the state and other states). As mentioned in interviews and a focus group, these outsider brigades create bitterness within the communities because

...they received salaries and had appropriate equipment. Resentment was raised among community voluntary fire fighters organized in community brigades who had no training, no equipment, and no salaries.  
*Las brigadas gubernamentales tenían sueldos y equipos apropiados, lo que causo resentimiento y malestar entre los voluntarios de las brigadas comunitarias que no tenían entrenamiento, equipos ni salarios* (Interview with a male Oaxacan forester, former community brigade leader and presently a governmental organization staff member, August 2004).

When the government brought in its fire brigades, community men said, well now, it is time to them to be in charge, since they have governmental support, a salary ...and that is why community men decided not to participate any more. Before that, the community was organized. As soon as the fire started... as soon as we see the first fume, that's when you have to stop it, before it is too late. Just because of the salary... That is why they [community men] do not want to participate. They say 'I won't go to extinguish that fire, how is it possible that there are others that do same or less than us, and they received a salary'... Nonetheless, we still participate, with or without a salary, because we do not want that forest vegetation wrecked.

*Cuando el gobierno empezó a nombrar sus brigadas en las comunidades ahí fue cuando los comuneros dijeron, pues ahora ya que se encarguen las brigadas del gobierno que tienen apoyo, que tienen sueldo y por eso es que ya los comuneros ya no participaron, pero antes de eso, la comunidad estaba organizada. No mas empezaba el incendio, no más que estaba humeando es que hay que caer para detener la lumbre antes de que sea demasiado tarde. No más por el ingrato sueldo, por eso es que ya no quieren participar. Como es posible que yo voy a apagar ese fuego, mas sin embargo hay quienes reciben ese sueldo y hacen lo mismo o menos que nosotros, los que trabajamos sin recibir nada a cambio... sin embargo, todavía participamos, con sueldo o sin sueldo, porque no queremos que se acabe la vegetación de la montaña* (S. Mature male from S.A. participating in a focus group to evaluate GIEMPBI Project. March 2004).

The brigades brought division because before the 1998 fires people here were united. The authorities announced a fire and all of us used to go,

nobody stayed, but after they [governmental institutions] brought all those official brigades internal division began... It also was related with the fact that the fire was extremely big and the situation was very complex. Nothing like this had ever happened before.

*Lo que nos trajo las brigadas fue divisionismo, porque antes de los incendios del 98, la gente acá toda estaba unida. Las autoridades comentaban que había un incendio en tal parte y ahí todos íbamos, nadie se quedaba, pero después que trajeron todas esas brigadas ahí fue el divisionismo.. Claro que también tenía que ver que el incendio fue muy grande y la situación estaba muy complicada, anteriormente no pasaba eso* (RA. Young male from S.A. participating in a focus group to evaluate GIEMPBI project. March 2004).

After the fires were extinguished, governmental programs centered their attention on the promotion of reforestation programs to heal the devastation left behind. It is questionable whether reforestation really increases communities' natural capital, particularly when reforestation is with monoculture pine, cedar or oak, and, more importantly, when communities' previous experiences with reforestation programs, or interest in the species promoted and effects on the ecosystem are not taken into account (Ament 1999, Asbjornsen et al. 2005).

The federal management plans did not take into account the inherent capacity of ecosystems to recover from disturbance (their resiliency) and the fact that interventions such as reforestation can exacerbate conditions (Asbjornsen et al. 2005). Another important external response to the fires with broad-scale implications was the revitalization of initiatives by different governmental and non-governmental agencies (CONANP, SEMARNAP, WWF, PRONATURA A.C. among others) to promote the establishment of a protected area (1999- 2000). The Chimalapas communities were adamantly opposed, which eventually caused a break in any negotiation between outsiders and the communities in the year 2000. This break widened the gap and reinforced mistrust between communities and external organizations (including NGOs and governmental agencies).

### **6.1 The Natural Reserve**

The governmental proposal for the establishment of a Biosphere Reserve was strongly rejected by local communities and triggered the disruption of

relationships between the communities and external organizations (governmental and non governmental) after the 1998 fire events. As an alternative to the government-proposed Biosphere Reserve and as follow-up to previous efforts, MPS and international conservation NGOs (mainly WWF) proposed an Ecological Campesino Reserve: The Chimalapas Ecological Campesino Reserve (CCER) (Russell and Lassoie n.d.). Even though the CCER was considered the model for the conservation of biodiversity (Russell and Lassoie n.d.), it never got the required recognition and endorsement from the state.

The most recent proposal for the establishment of a protected area in the Chimalapas is the Chimalapas Master Plan ("*Plan Maestro*") that was initiated at the end of 2003. The Master Plan is spearheaded by SEMARNAT, with active participation by CONAFOR, CONANP, CNA, PROFEPA, WWF, IEEO, SEDAF, COPLADE, CI, ITAO, SAGARPA, SRA, PA, FIRCO, SEDESOL, CDI/INI, COMUNITAS, PRONATURA and the State Government of Oaxaca (*Gobierno del Estado de Oaxaca*).

The Master Plan seeks to coordinate all the various institutions and programs currently working in the Chimalapas, with the goal of enhancing communication and collaboration, while avoiding duplication and competition. Further, the Plan Maestro aims to integrate interventions that focus on community-scale natural resource management, together with regional processes involving protected areas management. This vision provides an important framework for bringing together various actors and stakeholders to identify common goals and to encourage the formation of more synergistic and productive relationships. The major component of the proposed protected area within the "Master Plan" is the "core" or "nucleus" region of the Chimalapas. The core area remains relatively well conserved, but the core is surrounded by communities on its periphery that "threaten" the core area through agricultural expansion, fire use in agricultural practices, and over-harvesting of forest resources.



The major premise of a protected area within the Chimalapas Master Plan is that the following conditions need to be in place in order for conservation of this core area (and sustainable management of the periphery) to occur:

- 1) Written community statutes/bylaws about the management of communal resources within the two Chimalapas municipalities: Santa Maria and San Miguel.
- 2) Shared administration between communities and external institutions of the protected area, which would include a legal framework to guide the implementation of the protected area management.
- 3) Compensatory mechanisms for the conservation of natural resources (including payments for environmental services) that directly contribute to community development and sustainable livelihoods.

The three *sine qua non* conditions for conservation of the Chimalapas core area within the Master Plan are part of the modernization project that severely affects communities' cultural and political capital. The process of discussion and negotiation required to achieve these conditions has been underway at the state and regional levels for the past several years. Acceptance of the Master Plan and the establishment of the reserve area will require cultural changes on the communities' side starting with the acceptance of written bylaws, which have been under discussion for several years, breaking the non-written uses, customs and traditions (cultural capital), and consensus decision-making (political capital) described in Chapter Four. It will require an acceptance of joint administration of the communal lands something that has been impossible so far in the region (political capital), and finally the acceptance and adaptation of external models of "community development and sustainable livelihoods" negotiated with outsiders (cultural and social capital).

Most of the key agencies within the Master Plan are either decentralized and/or deconcentrated state agencies<sup>31</sup> (Figure 5.4). The organic structures of these

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<sup>31</sup> As already mentioned *Decentralization* refers to ceding of power from central government to local governmental agencies with central government keeping some measure of oversight over decisions. *Deconcentration* only involves the moving of central government staff to the local area maintaining hierarchical links with central government. *Devolution* is a more complete and permanent

agencies are the result of the contradictory development processes that evolved from and have been guiding modernization since the 1950s. The policies have shifted from stabilization and structural adjustment policies in the 1980s, and finally from the 1990s onwards having decentralization and democratization as central to inclusiveness and empowerment (Figure 1.1) (Escobar 1995).

## **6.2 Explaining new risks: changed institutional presence and culture accompany the modernization project**

Local community groups perceived the presence of outside organizations in the Chimalapas region as a way to impose order over the existing disorder, confusion and uncertainty left behind by the 1998 ecological disaster, as predicted by Beck 1999, Douglas 1992, Gergen 1994, Giddens 1990, and North 1991. They anticipated these outside organizations and agencies as a potential solution to problems. They hoped for greater coordination role among the diverse actors involved. Communities ambivalently acknowledged the hopes and the fears of institutional interdependence (Gergen 1994).

“Throughout modern times, new technological developments have created new regulatory needs. To date, however, changes in normative regulations have been produced as adaptations to societal transformations” (Habermas 2003: 24). After the 1998 fires, governmental institutions brought into the region new regulations that confronted, challenged and jeopardized the traditional social regulatory norms of “uses and customs” used within Chimalapas communities (cultural capital) (see regulation of environmental terms, Beck 1999).

Habermas (1987) argues that institutions are an expression of force, domination and coercion.

Finally, the two elements of domination over external and internal nature were bound together and fixed in the institutionalized dominion of human beings over other humans: ‘The curse of society and peace’ is based in all

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form of decentralization in which the power of central government is more limited (World Bank 2000b: 3.19). The term and concept of *devolution* is something that is not mentioned within the organic structure of SEMARNAT or other key Secretariats in the Chimalapas region

institutions, because they coerce people into renunciation (Habermas 1987:121-122).

One undeniable risk in terms of unintended consequences after the 1998 events was the increased presence of outside organizations in the Chimalapas region. The 1998 fires forced the Chimalapas communities to accept external presence to control the fires and to start processes of recovery of their natural capital. The presence of external organizations required tradeoffs by hastening the modernization process, including cultural changes. Some authors suggest an examination of the 'weakness of weak ties'. As Levitte (2004) discusses

"This is particularly true in the developing community context, where all too often external networks intervene with local ones, with no regard for local cultures and institutions ... The literature on the downside of social capital tends to focus on the problems arising from bonding relationships, but often ignores the potential of external networks, e.g. policy makers and NGOs, to be harmful" (p.58).

Marcuse and Newman (1998) pose an important question: "In the modern era, the philosophical setting of the doctrine of social change was chiefly determined by one basic question: how can a stable social order be established and perpetuated? " (p.108). The answer to this question is an institution, "a strong and undisputed government... to control the social dynamic and to secure prosperity and order" (p. 108). Government agencies are required to respond to change and social dynamics in isolated and marginalized rural communities as disorders and problems that need to be controlled and remedied.

Chimalapas communities' responded to the development process that started soon after the fires by demanding the inclusion of local knowledge and respect of culture in any project coming after 1998. Their reaction is rooted in their previous experience with NGOs<sup>32</sup> and governmental agencies<sup>33</sup>. Escobar (1995) argues that there is a need to *encounter development*: "The process of unmaking development,

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<sup>32</sup> Especially the communities experience with MPS that had participatory and inclusive vision and mission highlighting and encouraging the importance of communities' culture.

<sup>33</sup> With their paternalistic and clientelistic approaches.

however, is slow and painful, and there are no easy solutions or prescriptions” (p.217. Emphasis added).

Among key points to address in order to face a new phase in development, Escobar (1995) mentions the rise of hybrid cultures, traditional-modern, rural-urban, high-mass-popular, reaching socio-cultural mixtures, that lead “to a reconceptualization of a number of established views”. The author continues “rather than being eliminated by development, many traditional cultures’ survive through their transformative engagement with modernity” (Escobar 1995:219). Escobar (1995) argues that this deconstruction of development must include as alternatives:

- Resistant grass-roots strongly opposing dominant interventions (forcing acceptance, defense and celebration of cultural diversity)
- Recognition of agency and voice of the third world people
- Defense of the local “as a prerequisite to engaging with the global” (p. 226).
- Reinforcement of identities
- Opposition to modernizing development
- And the development of a shared and inclusive vision.

Some of these processes of unmaking modernizing development started within the Chimalapas communities after the forest fires, including the formation of the local NGO (CHUDEB) and the reinforcement of organized communities fire brigades. It was highlighted by the reinforcement of identities through the constant reiteration of the phrase “we the Zoque people” within formal communications with researchers and other outsiders.

This chapter analyzes the immediate institutional response to the forest fires, and its effects on the communities’ capitals. This response was unisectoral, attending the communities’ natural capital, and created animosity among the communities and between communities and official brigades, thereby eroding social capital. Further attempts by government agencies and NGOs to “control” natural areas (political capital), led to the disruption of communication between communities

and external agents (social capital) leaving behind growing distrust but also reinforcing communities' efforts to encounter development and have a voice in the decision-making about their communal natural resources. The following chapter illustrates an example of what I consider an innovative response to the fire events once an external team of researchers combined efforts with a myriad of stakeholders to offer a holistic approach to understanding the ecological and social consequences of the fires, and to help the ecosystems to recover after the disturbance while providing the communities with elements leading to a sustainable development and the equation of healthy communities equals healthy ecosystems.

## **CHAPTER 7. INNOVATIVE RESPONSE TO THE FIRE EVENTS AND EFFECTS: “GIEMPBI PROJECT”**

The Interdisciplinary Group for Participatory Research and Management of Forests and Fire, *Grupo Interdisciplinario para el Estudio y Manejo Participativo de los Bosques e Incendios* (GIEMPBI), was formed (February 2000) as a response to the 1998 forest fires events in the Chimalapas region, State of Oaxaca, Southeast Mexico (Figure 1.2). This group integrates the capitals of various faculty members at Iowa State University (ISU), counterpart researchers from the Technological Institute of Agriculture of Oaxaca (*Instituto Tecnológico Agropecuario de Oaxaca- ITAO*), and other local, national and international collaborators to design an interdisciplinary, collaborative and coherent program of research, education and community development. Those capitals include human capital (knowledge, leadership and experience), social capital (contacts and networks), built capital (advanced measurement and communications technology), and some political capital (political connections within governmental agencies). Unfortunately, the group did not bring with it much financial capital, which in the long run ended in the deterioration of the relationships (a timeline of the entire process within San Miguel Chimalapas communities and the different capitals affected by activities in different phases of the process is offered in Appendix 5).

The project started with a strong emphasis on the analysis of the ecological effects of forest fire events and an analysis of how water and forest fires are linked in Montane Tropical Cloud Forests (MTCF). It expanded to link the science to people, considering the implications of water-forest-fire relationships for people living in these regions, and how biophysical knowledge about the linkages and effects can be used by local communities to better manage their natural resources. This focus was of particular interest to potential providers of financial capital and federal level political actors in government agencies in terms of political capital. The long-term goal of the project was the development of community-based model systems to promote the conservation of ecosystem processes and biodiversity and the

sustainable use of natural resources in Chimalapas watersheds containing tropical moist forest ecosystems affected by fire.

The initial research approach focused on ecosystem recovery after an extreme event and later in discussion with the communities it moved to include assessing concepts of sustainability within agricultural production systems and forest management, as well as the historical, cultural and social factors that influence decision-making processes and changing land use practices towards a more sustainable use of the community natural capital. These objectives were to be accomplished through the integration of ecological and social research with local community development initiatives related to natural resource management, facilitating the creation of model systems for linking research with engagement and having broad applications in rural communities within Mexico, the United States, and other regions in the world.

GIEMPBI led a series of meetings among different actors (institutional and individuals) to exchange ideas, using communicative action (Habermas 1990), about the Chimalapas situation, and to explore possibilities of conducting a participatory research that could start a truly sustainable development of the region in general.

GIEMPBI and its project to study fires effects was perceived as a 'glue' and 'call' to restart the work in the Chimalapas zone

*GIEMPBI y su proyecto de estudio de los incendios se presenta pues como un ente aglutinador y convocante para regresar al trabajo en la zona de los Chimalapas.* (Interview with a male staff member of an international NGO working in Oaxaca. June 2003).

GIEMPBI was consider by stakeholders interviewed as a *tool of interaction*, as described and analyzed by Burke (1954), Habermas (1990), and Gergen (1971, 1991). In this interaction, GIEMPBI utilized not only face to face meetings, but used advanced technologies of communication- such as the Internet and desktop publishing- to link different stakeholders together.

Upon the request made by GIEMPBI to work together in the search for an understanding of the ecological and social effects of 1998 forest fires events, all the groups (communities and institutions) agreed to participate. The forest fire events and their effects, not only on the communities' natural capital, but also on all the

community capitals, referred to here as “*the domino effect on the community capitals*”, was the shared motivation to act together (Figure 5.3). The GIEMPBI proposal was accepted by communities, governmental and non-governmental organizations and agencies, and different sectors of the society as a joint process to reach a balance of the synergy of the community capitals towards a recovery of the health of the community and therefore to “heal” the natural capital and accomplish a healthy ecosystem.

### **7.1 Negotiating Control and/or Opening Spaces to Collective Reflection**

As mentioned in the different interviews and conversations and observed in the assemblies and diverse meetings, GIEMPBI’s presence opened and promoted spaces for collective reflection beyond the efforts to understand the ecological effects of fires. The signed Memorandum of Understanding (MoU) forced different stakeholders to assume (at least on paper) a role in the process. Different activities required strong negotiation as well as a willingness to compromise to reach a shared vision among communities, governmental and non-governmental institutions and researchers. Negotiated elements of the project included Memoranda of Understanding, selection of pilot communities, development of the community productive projects, inclusion of sociological research, joint generation of knowledge to filling/ addressing knowledge gaps and the importance of dialogue and reflection towards recovery and transformation of the community capitals.

#### **7.1.1 Memorandum of Understanding (MoU)**

In 2000, in response to the 1998 forest fires and the appeals made by the research team, different institutions became involved in the development of a proposal to evaluate and assess the impact of anthropogenic fire and jointly develop an integrated ecosystem management model in the tropical forest regions of Los Chimalapas in a highly participatory and inclusive manner (Figure 7.1, Table 7.1).

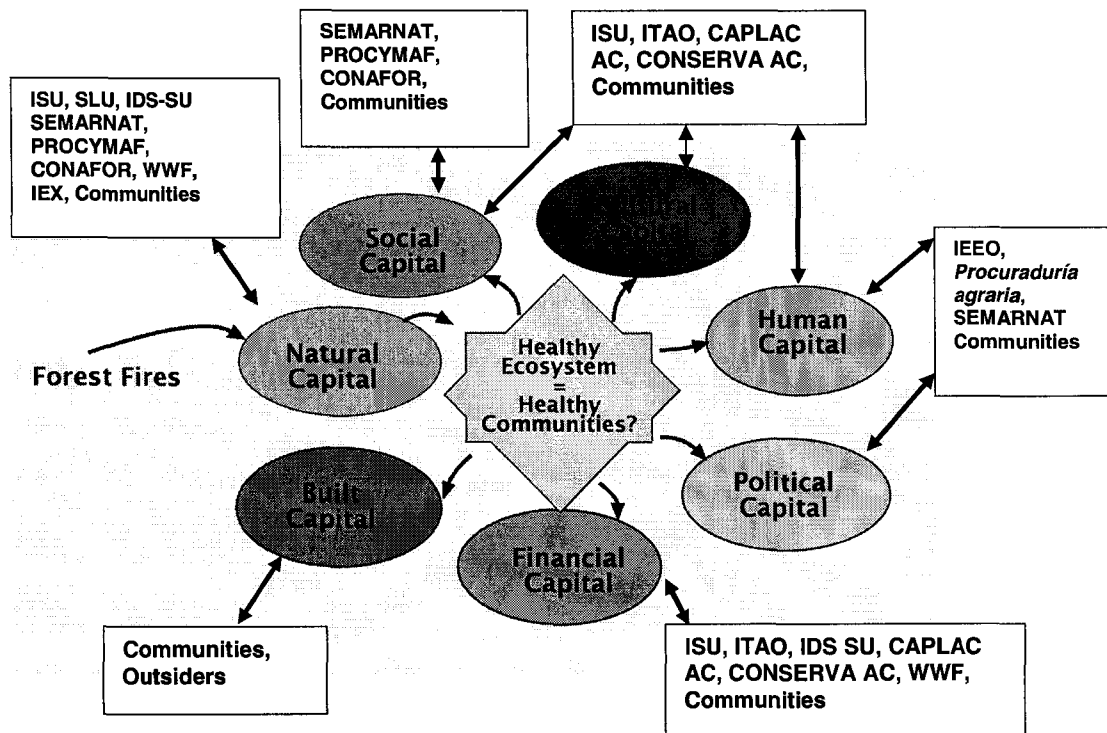


Representatives from all the participant institutions (Table 7.1) declared that<sup>34</sup>:

1. The common objective is the monitoring and assessment of the recovery of forest ecosystems in the Chimalapas region and to contribute to the conservation and sustainable use of its natural resources.
2. They recognize the importance of having active participation from Chimalapas communities in the research of their natural resources and to have access to the results to understand their options and make informed decisions.
3. This project is an entirely technical and scientific effort, and the main objective is to generate information and knowledge on Chimalapas forest ecosystems and to identify options for the conservation and management of natural resources.
4. This project has neither a relationship with political entities nor direct influence on political issues that affect the Chimalapas region, such as the declaration of an ecological reserve in the region, the formation of brigades for the combat of forest fires, agrarian conflicts and the establishment of municipal borders.
5. Information and results of this project are going to be shared with Chimalapas as well as with the participant institutions in a direct and clear way, through the appropriate mechanisms agreed upon in advance.
6. Project activities could provide a venue to gain moral support and facilitate communication between Chimalapas communities and the exterior, but always with the understanding that the technical team cannot make any commitment and has no right to directly participate in the political decisions within the Chimalapas.

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<sup>34</sup> From memorandum of understanding MoU/agreement signed by all the participant institutions (research and "linking" institutions) as well as by communities' representatives and authorities Appendix 4.



**Figure 7.1 Mapping Main Stakeholders Response to “The Domino Effect” of Forest Fire Events on Community Capitals (based on the interviews and MoU).**

After a series of meetings and negotiation processes in Oaxaca City, Juchitán (Oaxaca), and Municipality of San Miguel Chimalapas and selected participant villages, the communities (Municipality of San Miguel Chimalapa, Los Limones, Las Conchas, Benito Juárez and San Antonio), technical team (ITAO, ISU, IDS SU, SLU), and institutional links (IEEO, SEMARNAT and WWF) signed on November 4, 2001, an agreement to plan and collaborate on the project “Assessment of ecological impact of 1998 forest fires and development of pilot community projects in San Miguel Chimalapa, Oaxaca” (Appendix 4).

**Table 7.1 GIEMPBI Project main actors (since the preliminary stages) (Based in the interviews and MoU)**

<b>Actors/ Stakeholders</b>	<b>Roles/ Responsibilities (<i>Capitals</i>)</b>
<b>Research Areas (Main actors)</b> Ecological Area (ISU- SLU Swedish University of Agricultural Sciences)  Community Productive Projects (ISU/ ITAO/CAPLAC A.C <sup>35</sup> / CONSERVA A.C <sup>35</sup> )  Social Area (IDS SU/ ISU)	Coordinate/ Lead ecological research (Basic information on forest fires) ( <i>Natural, human, social</i> )  Community capacity building (COC)/ Lead sustainable community projects ( <i>Social, financial, natural, cultural, human, built</i> )  Coordinate/ Lead social research (facilitate/development of participatory process) ( <i>Social, human, cultural, political</i> )
<b>Institutional actors</b> ISU  ITAO  SEMARNAT- PROCYMAF <sup>35</sup> -CONAFOR <sup>35</sup>  WWF  SLU  IEEO  Procuraduría Agraria  Instituto de Ecología de Xalapa <sup>35</sup>	Define research/action lines. Congregate institutions around a research project ( <i>Natural, human, social</i> )  Institutional Support /Technical support-Follow-up productive projects ( <i>Social, human, cultural, political, financial, natural, built</i> )  Institutional Support, follow-up to some activities of ecological research ( <i>Natural, political, human, social, financial, built</i> )  Promote natural resource conservation strategies/ link institutions/ Promotion of participatory component ( <i>Natural, social, cultural</i> )  Research on social and ecological impact of the forest fire events ( <i>Natural, social, human, financial</i> )  Governmental, political and institutional support ( <i>political, social</i> )  Ensure access to knowledge and benefits to the communities ( <i>Human, political, cultural, social, natural</i> )  Technical support for the ecological research ( <i>Natural and human</i> )
<b>Communities</b> San Miguel Chimalapa Benito Juarez San Antonio Los Limones Las Conchas Santa Maria Chimalapa <sup>35</sup> Undefined	Active participation in the different stages of the project  Gradually assume the control and management of the project as a Community Natural Resource Management Project  ( <i>All capitals equally important</i> )

<sup>35</sup> Not included in the memorandum of understanding, but with an important role within the project.

The main objectives of the agreement/ memorandum of understanding were:

- 1- To assess and analyze the ecological effects of the 1998 forest fire events on some tropical forest of San Miguel Chimalapa, Oaxaca.
- 2- To analyze the historical context of control and management of fires from the community and institutional perspective, assessing the contribution of local and technical knowledge in the formulation of strategies for management of natural resources.
- 3- To collaborate in planning and implementing community productive and conservation projects, which improves the communities' quality of life while favoring forest conservation.
- 4- To use a participatory methodology in the technical and communitarian work to allow a continuous exchange of ideas, knowledge, and experience.
- 5- To promote the academic collaboration and exchange of researchers and students from institutions and participant communities.

The main functions and responsibilities assumed by San Miguel Chimalapa Municipality<sup>36</sup> include participation in the planning phase of the project and keeping the community informed on the proposal and main activities, coordination of planning activities, revision of documents and provision of inputs, provision of logistical assistance to the technical team, and help in the diffusion of information on activities and results to communities and participant institutions.

The participant villages' (Benito Juarez, San Antonio, Las Conchas and Los Limones) main functions and responsibilities were<sup>37</sup> selection in an assembly the technical team (responsible to actively participate within the different phases of the project and share information with their communities), participation in community workshops and training activities as part of the process and provision of logistical assistance to the technical team. Help diffuse information of activities and results to

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<sup>36</sup> Agreement/memorandum of understanding has the signature and seal from municipal authorities (Appendix 4).

<sup>37</sup> Agreement/memorandum of understanding has the signature and seal from each village police agent and auxiliary secretary (representative of communal property commissar) as well as signatures from two members of community committee (Appendix 4).

communities and participant institutions and participation in the implementation and management of community productive projects.

The research institutions<sup>38</sup> (ITAO, ISU, IDS SU, SLU) agreed to develop a methodology that would endorse the assessment and monitoring of the ecological impact of fires on forests including community participation, in the ecological study fieldwork. Commitment on part of research institutions included planning, formulation and implementation of some community pilot projects providing appropriate technical and organizational training, maintenance of constant diffusion of information about activities and results from the project (to communities and institutions) and facilitation of access to documents of other related works (finished or in process) relevant to The Chimalapas.

The “linking institutions”<sup>39</sup> agreed to facilitate the process of planning through support with inter-institutional links at all levels (community, state and federal), to facilitate field work with logistic support as conditions permit (e.g., transportation, accompaniment and diffusion of information), and to facilitate access to studies, projects and other relevant work already finished (or in process). They also agreed to answer questions and assume the political role under their responsibility and to provide official documents and communications to present and explain (when necessary), as well as to facilitate project development, to be responsive, in a constructive way, to the communitarian productive projects, without modifying work agreements between communities and technical team, and to present information about project only after this information has been discussed with the communities or with the existing previous consent from pilot communities and technical team.

Recognizing the stress imposed on the communities by the forest fire events and communities’ vulnerability, GIEMPBI included in the agreement *the guidance philosophy of the group* that highlighted commitment to:

- Respect the communities’ authorities and structures of power. This respect included communities’ and institutional agreements and solicitation of permission

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<sup>38</sup> Representatives from research institutions signed and sealed the agreement.

<sup>39</sup> IIEO, The Attorney General’s Office for Land Reform (*Procuraduría agraria*) SEMARNAT and WWF Oaxaca, whose legal representatives signed and stamped the official seal.

to the collection of information and research materials as well as recognition of the value of local/indigenous knowledge about their natural resources and its inclusion as a fundamental part of the project (political and cultural capital).

- Recognition of the importance of communities' participation in the whole process (human and social capital).
- Help in the solution of some specific problems within the possibilities of the technical team (financial, natural, built capital).
- Present and discuss results from different project phases (human capital).
- Avoid making public declarations that could harm communities' interests and project development as well as maintain a neutral role regarding political issues at community, state and federal levels (political capital).
- Not seek profit with project activities (financial capital).
- Respect governmental programs (state and federal levels), participating only if there is a consensus with the communities that their presence is desirable (political capital).
- And finally, to present and shared results of the project to communities, normative and academic institutions (political, human and social capital).

### **7.1.2 Selection of Pilot Communities**

The process of selection of the participant pilot communities was a process of negotiation between the GIEMPBI technical team and community authorities. In her article "Social aspects of small water systems", Flora (2004: 11) concludes, "Although sustainable water systems often seem entirely dependent on technical expertise and funding, community participation has had an impact not only on the system's sustainability but on community sustainability as well". For the GIEMPBI team, community participation was essential to obtain permission to conduct the ecological research and to accomplish the sustainability goals set at the beginning of the participatory ecological project "Healthy community= Healthy ecosystem". For Chimalapas communities and authorities, active participation was a condition *sine qua non* to allow entrance, settlement of the technical team among the communities

and collection of data by outsiders, but moreover to maintain control over their resources (Floras' (2004) community sustainability).

As mentioned in the chapter describing the site and its processes, four communities were selected by GIEMPBI in consultation with municipal authorities to take active part within the whole participatory project, Benito Juarez, San Antonio, Los Limones and Las Conchas. Benito Juarez and San Antonio villagers carry out forestry activity, with a provisional permit to extract timber products since April 6, 1981 (Ament 1999), as well as having governmental permission (granted by CONAFOR) to extract some non-timber products (especially camedor palm). Both villages are located directly adjacent to the nucleus zone<sup>40</sup>, near the burned areas, and therefore were directly affected by the 1998 fire events. The two latter villages experienced substantial population growth doubling their population between the 1990 and 2000 censuses (see Table 4.1). Due to Benito Juarez and San Antonio's forestry vocation and their location nearby the zone where pressures on intact forest resources are the greatest, their inclusion and active participation within the ecological project was key for the initial purposes of the ecological project.

Even though the two central communities, Los Limones, with extensive livestock production as their main activity, and Las Conchas, with forestry as an important productive activity, are located far from the fire events nucleus, they were also severely affected by forest fire events due to water scarcity. Inclusion of these two communities was part of the negotiation process with the municipal authorities. As we can see from census data (Table 4.1) human populations in these central villages are larger than those of the newer, peripheral villages. Likewise most internal decision-making (informal policy formulation within San Miguel Chimalapas communities) regarding natural resource management occurs there, so their inclusion was key for the municipal authorities<sup>41</sup>. Consequently it was important to include these two communities affected by the fire not only to accommodate the

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<sup>40</sup> A nucleus zone is considered an intact and most important conservation area within a forest

<sup>41</sup> Los Limones and Las Conchas were not included in the ecological field research. As mentioned they are located far from the burned areas and the research plots were located in the burned areas in the vicinity of San Antonio and Benito Juarez

authorities that were demanding more attention to the central zone villages but also because of the relevance of their productive activities within the long term goal of the GIEMPBI project “*to promote the conservation of ecosystem processes and biodiversity and sustainable use of natural resources in Chimalapas*” (MoU, Appendix 4).

### 7.1.3 Community Productive Projects

Ecosystem managers in rural areas in Mexico “are rural producers who, within particular social and institutional contexts, make decisions regarding land use and transformation” (Castillo et al. 2005: 754). Gonzales (1999) concludes that while the Chimalapas communities could not increase agricultural yields and diversify their natural resources management activities, decision making regarding conservation processes, territorial ordinance (*ordenamiento territorial*<sup>42</sup>) or the establishment of protected areas of any kind could be just slightly successful. In order to reach the sustainability goal set at the beginning of the GIEMPBI project, it was necessary to help the communities, who are the Chimalapas’ ecosystems managers and decision makers (Castillo et al. 2005), in the process of diversification of natural resources management activities (Gonzalez 1999).

According to Ament (1999), the three communities involved in the project as pilot communities with forestry activities (Benito Juarez, San Antonio and Las Conchas) had previously participated in governmental reforestation programs. In 1995 SEDAF started a reforestation program in Benito Juarez, but the community rejected the project because the trees to start the program were sent into the community in March, during the dry season, the period of the year when communities are struggling to get water for household use and for agricultural fields. In 1996, San Antonio received support from SEMARNAP to start a reforestation project with pine, and the same year, Las Conchas, got support from SEDESOL to start a reforestation project with pine, oak and cedar. In 1998, San Antonio received

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<sup>42</sup> Land use planning



support from SEMARNAP to continue the reforestation program but this time with cedar and oak (instead of pine as provided in 1996).

Despite the fact that the communities recognize the importance of reforestation in the conservation of their forests and their other natural resources, it was necessary to move beyond mere reforestation activities into a more coherent model that would bring productive alternatives, and which at the same time could provide (or support) social wellbeing and development with appropriate and sustainable models of production. Acknowledging that a balance between the community capitals is essential to making decisions about development and resource use (Flora et al. 1999), GIEMPBI committed to include community productive projects that could reinforce communities' financial capital, but also recognize the relevance of these projects in the decision making about the natural capital. This was the origin of the community productive projects or Sustainable Natural Resource Management models, SNRM. Participating communities along with municipal authorities identified (during participatory workshops) the proposed community-productive projects as an alternative source of resources to better protect communal forests (Table 7.2).

**Table 7.2 Community Productive Projects by village that fitted criteria established by communities and GIEMPBI- SNRM.**

Village	Project	Criteria
<b>Benito Juarez</b>	1. Conservation through prevention and combat of forest fires. 2. Agroforestry (Coffee and camedor palm) 3. Healthy agriculture (home gardens, sustainable agricultural practices)	<ul style="list-style-type: none"> <li>➤ Accepted by the entire community</li> <li>➤ Does not harm the environment</li> <li>➤ Benefits the entire community (equitable)</li> <li>➤ Promotes community participation, exchange of knowledge, and recovery and conservation of ecosystems</li> <li>➤ Based on shared responsibility for project administration and implementation</li> <li>➤ Within the capacities of GIEMPBI</li> </ul>
<b>San Antonio</b>	1. Healthy agriculture (home gardens, sustainable agricultural practices)	
<b>Las Conchas</b>	1. Reforestation for water conservation with native timber species and fruit trees	
<b>Los Limones</b>	1. Healthy agriculture (home gardens, sustainable agricultural practices)	

An important objective of the GIEMPBI-SNRM model was to reduce conversion of forests (both primary and secondary forests) to agricultural lands by increasing the value of the forests through sustainable production and marketing of

high-value forest products. Negotiation for the inclusion of the community projects into the GIEMPBI ecological research project (Table 7.2) was an expression of the interactional situation between outsiders and communities that resulted in a directed cultural change (Naylor 1996). Community members were active participants of the whole process, insisting that the technical team include community issues and inputs as part of a more holistic project.

The ecological research was then re-designed to complement and directly support the SNRM models. Villagers participated in all aspects of planning the research, and the technical team placed strong emphasis on local participation in the analysis and application of the ecological research results, seeking to facilitate the understanding of the relationship between research on natural resources and a healthy community (interdependence between the ecosystem and the community). Monitoring field studies (within the ecological research) using indicators developed by both local people and researchers were intended to ensure that the process and results had relevance for solving natural resource management issues in the region, as well as broad application to other regions. Considering that conventional land use practices in the region are rapidly degrading the natural resource base and alternative more sustainable models are largely lacking, applied-participatory research was essential to developing effective alternatives.

Alternative production systems, based on the concept of sustainable natural resource management that contribute to both subsistence production and enhanced rural economies, have not been adequately developed and tested for the Chimalapas region. The applied agricultural (healthy agriculture, reducing the use agrochemicals) and agroforestry (coffee and camedor palm, two important sources of income) proposals for the community productive projects were planned and presented in GIEMPBI's GEF UNDP proposal<sup>43</sup> to work with local farmers to promote more viable production options for the region that do not harm the environment, while enabling local farmers to enhance their livelihoods (Table 7.2).

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<sup>43</sup> Full medium-sized project brief to GEF's Biodiversity Program (section: Mountain Ecosystems) in December of 2001: "Community montane ecosystem management model for the tropical forest regions of *Los Chimalapas*"

This was proposed to be accomplished through the establishment of demonstration areas in each community, where field experimentation would be conducted on different practices related to *healthy agriculture*<sup>44</sup>. Demonstration areas were supposed to be developed by local farmers and supplemented with complementary knowledge, training workshops, and field visits by the technical team, when appropriate.

Successful development of community management plans for fire prevention and control, proposed by Benito Juarez (Table 7.2) also involved the experience and participation of San Antonio. The proposed plans required baseline information about the ecological and human contexts that influence the occurrence and effects of fire in the region, and which at the beginning of GIEMPBI project (year 2000) did not exist. The ecological project involved local farmers in the collection and analysis of the information, and in the integration and application of this information to fire management planning. The project, in turn, would document the human and ecological aspects of fire dynamics for a mountain tropical region and the sociopolitical processes required to effect positive change in reducing fire risk. It thereby would provide a valuable model for broad scale application within the region and elsewhere. This was the main justification of the ecological participatory research project to the communities, to the authorities and to the institutions (governmental and non-governmental) involved in the GIEMPBI project (Table 7.1).

#### **7.1.4 Inclusion of Social Research**

Agrarian conflict in the Chimalapas region results from a combination of immigration and encroachment pressures coupled with formal colonization and resettlement policies impinging on land and natural resources that by legal title have long belonged to the indigenous Zoque population (De Teresa 1999, Viqueras

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<sup>44</sup> Communities placed a strong emphasis on irrigation practices, mainly because of the scarcity felt after 1998 fire events, and the effects on agricultural yields (especially the tomatoes production that was an important source of income for some community members). As part of the participatory workshops with the communities, GIEMPBI technical team facilitated the holistic approach of healthy agriculture that included irrigation but also the inclusion within the concept of healthy of concepts of diversification and other sustainable practices less chemical dependent

1999). Zoque people have inhabited the region for at least 2 millennia, but in 1687 they re-acquired legal title to their ancestral land by means of a purchase paid to the Spanish crown. However, due to the low population density of the Zoques and their traditionally low-impact self-provisioning lifestyles, the Chimalapas region has long been considered an “empty”, if inhospitable, region, and has therefore become a prime magnet and “sink” for colonizers seeking land for settlement and exploitation (pull factors)<sup>45</sup>. Such settlers come from other areas of Oaxaca, but also from neighboring Chiapas and from as far away as the state of Michoacan. These settlers typically seek to escape, or are ejected, by a combination of political forces, land degradation and overpopulation in their regions of origin (push factors e.g., land conflicts in Chiapas, displacements in Michoacan and relocation from other states) (De Teresa 1999, Viqueras 1999).

Fundamentally, the agrarian conflict in the Chimalapas is as much about the encroachment of both outsiders and Mexico’s legal system on the Zoque people and their territory as it is about differing philosophies and approaches toward natural resource use. Colonizers are typically agriculturists of some sort, and their traditional subsistence methods call for deforestation and the establishment of extensive pastoral and cropping systems. Both the methods for clearing or exploiting forest resources as well as the extensive and burgeoning pressure on land, forested or not, are the proximate causes for disputes over boundaries, legal extraction rights, private property, native rights and legal jurisdictions. There are still disagreements regarding the proper boundaries of the two political districts comprising the Chimalapas (San Miguel and Santa Maria), the proper boundaries between the states of Chiapas and Oaxaca (affecting especially San Antonio and Benito Juarez villages), the jurisdiction of local, state and national governments and agencies, each charged with some component of oversight regarding natural resource use or political representation (De Teresa 2001, Villalobos 2001, Viqueras 1999).

The social dynamics summarized here have been exacerbated by concerted governmental policies, dating to the 1950s, to promote the establishment of

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<sup>45</sup> Similar situation was described by Arizpe et al. (1996) in the neighbor state of Chiapas.

outsiders in the region, together with the implantation of modes of local governance and land tenure that were foreign to the native Zoque population (e.g., the establishment of *ejidos*). The indigenous Zoque population, now in the minority, has responded by supporting increased settlement on communal lands in the Chimalapas region. They do this by establishing and maintaining permanent settlements in remote areas near the territorial boundaries under the control of the municipal authorities, who provide protection from external invasions, thereby attempting to assert and secure their territorial jurisdiction<sup>46</sup>. This is the case of San Miguel Chimalapas eastern villages included as pilot communities: Benito Juarez and San Antonio (De Teresa 1999, 2001, Viqueras 1999).

At the beginning of the GIEMPBI project (2000), in an open and explicit way, communities expressed their desire for sociological research to help them seek a solution to the agrarian conflicts increasingly present within the communities and recognized by them as their main social issue. The Mexican constitution prevents foreigners of any involvement in agrarian and political issues<sup>47</sup>, thus Chimalapas GIEMPBI researchers were not able to conduct any research referring to the agrarian situation. The project team proposed and negotiated with the communities an alternative approach combining participatory research on ecological, productive/ SNRM and socio/political factors- all affecting community health- to broadly encompass Chimalapas' complex and critical situation (Figure 7.5).

In sum, the Chimalapas-GIEMPBI project aimed to reduce the risk of wildfires that were associated with cattle ranching and/or the agrarian conflict through the following outcomes: 1) enhanced local community capacity to detect and control fires (ecological participatory research), 2) improved burning practices and enforcement of those practices by local authorities (ecological participatory research), 3) development of alternative natural resource management models that are economically profitable and do not require fire to maintain e.g., , permanent

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<sup>46</sup> The so-called *second phase of colonization* mentioned by De Teresa (1999, 2001. Emphasis added).

<sup>47</sup> "Foreigners cannot in anyway be involved in the country's political issues" "*Los extranjeros no podrán de ninguna manera inmiscuirse en los asuntos políticos del país*" Title 1, Article 33 - Derecho de los extranjeros / Prohibición en asuntos políticos. Presidencia de la Republica, México

agroforestry systems, organic agriculture for high-value crops (community productive projects/ SNRM), and 4) strengthened community organizational capacity and negotiation skills enabling communities to more effectively solve conflicts with external groups related to land use and access. By better understanding the goals and objectives of the various institutional actors with which they interact, the communities can better define where there are corresponding desired future conditions and thus work with the groups to examine alternative means (socio-political participatory research).

#### **7.1.5 Explicit/Implicit Interest in Knowledge: Addressing Knowledge Gaps**

The 1998 forest fires introduced incredible environmental stress and pressures, represented mainly in water scarcity and the subsequent low agricultural productivity and less availability of forest products (timber and non timber) relevant to those communities with productive forestry activities. This situation favored, and urgently demanded, responses from within the communities (Figure 5.1). The immediate and obvious response of the communities was their willingness to accept a participatory ecological study led by outsiders/researchers, which represents a culture change (Naylor 1996) within rural communities that consistently blocked outsiders' presence and influence over their natural resources. This also gave the communities - as ultimate land managers and decision-makers within the Chimalapas region- the opportunity to negotiate under their own customs, uses and traditions the importance of their "cultural capital" in the management of their natural resources (natural capital).

The Chimalapas GIEMPBI project was conceived with the idea of filling knowledge gaps in understanding water-forest-fire relations, but surpassing the stage of just offering information, which has proved to be insufficient because mere information does not change behavior, to a more holistic approach of jointly production of knowledge among all the implicated in the Chimalapas land management (communities, state agencies, non-governmental agencies interested

in sustainable land use and research institutions) (Figure 7.2). In a study aimed to understand the role of ecological science in promoting sound environmental decisions, Castillo et al. (2005) argue that “The application of ecological knowledge requires new interactive and participatory forms of research, as well as sound partnerships between ecologists and land managers” (p.745). The authors conclude from their research, “Direct interaction between scientists and rural managers, as well as understanding rural information needs, cultural characteristics, and productivity bottlenecks, should be recognized in order for there to be effective use of ecological information” (Castillo et al. 2005: 754).

Flora et al. (2004) mention, “cultural capital determines what constitutes ‘knowledge’, how knowledge is to be achieved, and how knowledge is validated” (p.25). In the selection, negotiation and development of the community proposals submitted to GEF-UNDP in 2001, communities were clear that one of the most important criteria was that the project “*Promotes: community participation, exchange of knowledge, and recovery and conservation of ecosystems*” (Table 7.2). This “exchange of knowledge” was considered within the communities as the inclusion of local/traditional knowledge within the proposed participatory project. Participants in the community committees were active in the selection of the research plots, as well as in sharing their knowledge about forest species with the technical team. Similarly, within the fire brigades, community knowledge regarding the forests has been essential for controlling the fires. Community fire brigades knew the sites, and served as guides for the external brigades. They had trails, knew the terrain, and were in good physical condition. Additionally palm collectors from the communities had an extensive knowledge of forest species (personal communication, principal ecological researcher. July 2005).

The Chimalapas-GIEMPBI project, which started in 2000 purely as a participatory ecological project to study the ecological and social impact of the forest fires events in 1998, evolved into- following an intense period of negotiation- a project with a participatory, integrated and interdisciplinary approach. Within the project, the ecological research was designed to be balanced with the socio-political/

environmental policy research and the community productive projects (sustainable natural resource management) (Figure 7.5). The new approach highlighted a holistic view of sustainable natural resource management, having as the final goal and most important outcome the communities' empowerment: shared creation of knowledge as means to empowerment<sup>48</sup>.

At the time of the forest fires, there was minimal information regarding the human and environmental dimensions of fire in the Chimalapas region. The unique character of the 1998 fires, in non-coniferous forests that previously had not burned and where there was no local nor scientific knowledge about their recovery patterns and potential, surprised the local as well as the national and international community. For the first time, fire was established as an overriding threat to both socioeconomic and ecological sustainability in the region (Figure 5.3). Research, as a means to generate knowledge, was needed by both rural communities directly affected by the fires, as well as by outsiders either indirectly affected or having scientific and ecological conservation-related interests in understanding the major drivers that determine the occurrence and effects of fire in the region, e.g., the use of fire as an agricultural tool and factors contributing to escaped wildfires. It was also important to identify areas of high fire risk. The ecological and socioeconomic impacts of fires that affected the region's large expanses of tropical moist forests represented an unprecedented situation in recent history.

The potential information about the relevance of conservation of communal resources was key for the community members as a negotiation tool. Knowledge about the importance of the forests and forests vulnerability to fires and other ecological disturbances, would provide the communities with elements to justify actions toward restoration projects, protection against biopiracy and demand for environmental services payments (water, biodiversity conservation and carbon sequestration among others).

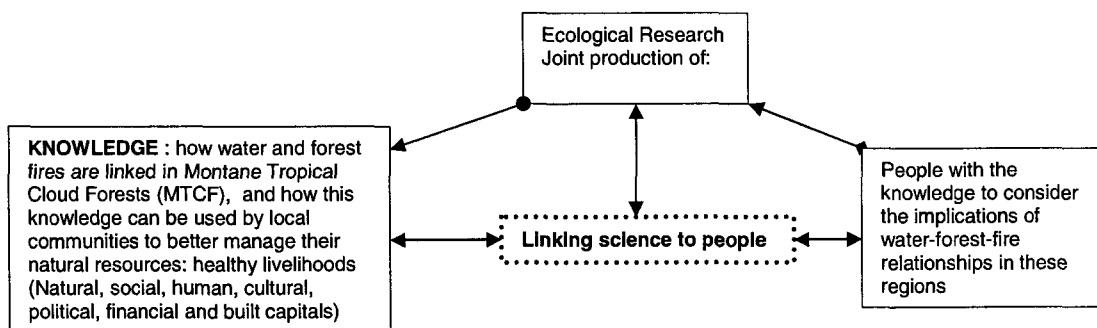
Within the GIEMPBI project the information on impact of forest fires was intended to be collected with the participation of local communities and government

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<sup>48</sup> This was the vision, but it was not completely achieved.



agencies responsible for fire management to enable the identification of key factors and processes contributing to the fire problem. This included highlighting the importance of raising consciousness within community members towards reducing the use of fire in agricultural practices, considering that most of the fires were human induced (uncontrolled fires), as well as by the identification of critical sites for protection and restoration (Asbjornsen et al. 2005). The result of this research would be the design of a unique and integrated fire management program different from current approaches. It would evolve through close collaboration between the local people—primary fire-users and fire fighters—and the government agencies and NGOs—which set the fire management programs and policies that determine external interventions for addressing fire-related problems. Traditionally efforts at these two scales operated independently and, more often than not, resulted in disjointed and ineffective approaches as was seen during the effort to control the fires. Through integration of knowledge obtained through problem-solving action-oriented research with collaborative analysis and planning, a fire management strategy was supposed to be developed to enhance both environmental sustainability and promote more healthy livelihoods (the community capitals) (Figure 7.2)



**Figure 7.2 Ecological research linking science/knowledge to people.**

In the context of the modernization process, joint production of information and knowledge about ecological processes would have an impact on the community capitals as a whole. In the case of restoration and regeneration patterns, it would

have an effect on natural capital. In terms of taking actions and establishing monitoring activities, the impact would fall on human, natural and social capitals. Integrated management of communal resources would impact political, social, cultural, natural and human capitals. Finally, relevance, recognition and acceptance of local brigades as well as negotiation of best practices and management activities would require enhancing all the community capitals (Figure 7.2).

#### **7.1.6 Dialogue and reflection towards recovery and transformation**

As discussed above, the root causes of the unsustainable land management in the Chimalapas are multifaceted and complex. The current population consists of predominantly migrants from Oaxaca and other states of Mexico who came to the Chimalapas for a variety of reasons (push and pull factors), such as government relocation programs, unproductive lands in their home region and in search of land for self-sufficiency, fleeing violence related to agrarian conflicts or internal disputes, or just basically in search of a better life (De Teresa 1999, 2001). In many cases, these new migrants are unfamiliar with the new environment where they are now living, and bring with them land use practices that are not necessarily appropriate to the Chimalapas' conditions. Further, their knowledge of less intensive traditional practices such as gathering wild foods and medicines is often poor (Gonzales 1999).

In the Chimalapas region reliance on subsistence crops (maize and beans) and unsustainable practices (slash-and-burn) combined with lack of sustainable income-generating alternatives creates a cycle of environmental destruction and poverty (Gonzales 1999). In communications, transportation, education system, health care, commercial infrastructure and security in food production, San Miguel Chimalapas has the lowest indices in the country and shows the highest levels of marginality in Oaxaca (De Teresa 1999). The coincidence of poverty and marginalization and their mutual reinforcement sometimes obliges Chimalapas peasants to over-exploit their communal lands.

However, the unsustainable ecological situation in Chimalapas is not only the communities' responsibility. Timber and livestock interests are the main problem in

the region. Timber harvesters come from both within and from outside the communities, but all are motivated by payments from external logging enterprises. Likewise, there are nearby cattle ranchers (mostly from Santo Domingo de Zanatepec and Chiapas) that impinge on the communal lands. As Escobar (1995) argues, poor peasants, with machetes and big families are blamed for the degradation of the world's resources. Contributions from shrinking governments responding to World Bank and International Monetary Fund structural adjustment programs with diminishing institutional presence in the region, the effects of the transnational corporations with mechanized models of overexploitation of resources and backing up timber and livestock enterprises, and the "fact that the populations of the industrialized world consume strikingly higher percentage of world resources than the Third World counterparts" (Escobar 1995: 211) exacerbate the unsustainable resource use and are often overlooked or ignored.

There is an ambiguity about who exactly are the land managers in the Chimalapas' situation, which leads towards conflict over responsibilities and management of communal lands. Governmental and non-governmental agencies that consider the region highly conflictive limit their influence and their presence to being reactive and typically respond to crises often in an overly technical manner. Agencies often consider Chimalapas' issues and problems under the umbrella of "problems with technical solutions" (Hardin 1968), whereas the long-term solutions are political, economic and social. As an example we find the reforestation programs promoted in the region by different institutions (CONANP, SEDAF, SEMARNAT and SEDESOL) as "the solution" to deforestation and forestlands degradation.

An increasing number of social actors "acquire" rights over the Chimalapas' resources, but no one has duties and commitments, and there is a strong predisposition to consider all ecological problems as having technical and top down solutions. In Hardin's (1968: 1243) words "A technical solution may be defined as one that requires a change only in the techniques of natural sciences".

Ineffective community organizational capabilities and the lack of ability to forge advantageous linkages with external groups (e.g., , advocacy coalitions) were

common elements of the region prior to the 1998 forest fire events. Many community projects have failed due to lack of community ownership and responsibility over project implementation. This was exacerbated by the absence of community organizational structures capable of responding to project needs and changes (as was the experience with Maderas del Pueblo del Suroeste-MPS) (CHUDEB and CAPLAC 2000).

As previously mentioned, the Chimalapas-GIEMPBI project served as a liaison between communities and external organizations. Federal government and their State agencies or federal delegations<sup>49</sup> started working together, along with the GIEMPBI project team and Chimalapas communities, in the participatory natural resource management project in the Chimalapas region after the 1998 forest fires as institutional links, founders and policy support (e.g., SEMARNAT, CONAFOR, and Program for Conservation and Sustainable Management of Forest Areas – PROCYMAF, WWF Oaxaca) (Figure 7.1).

Through the MoU a variety of state agencies, non governmental organizations, research institutions and communities made commitments towards a joint, proactive and truly sustainable management and conservation of the natural resources transcending specific and narrow projects targeting scientific/technical issues and solutions and attending to the community capitals as a whole: natural, social, human, political, cultural, financial and built.

## **7.2 Models of Fire Management: Collaborative rebalancing of the community capitals**

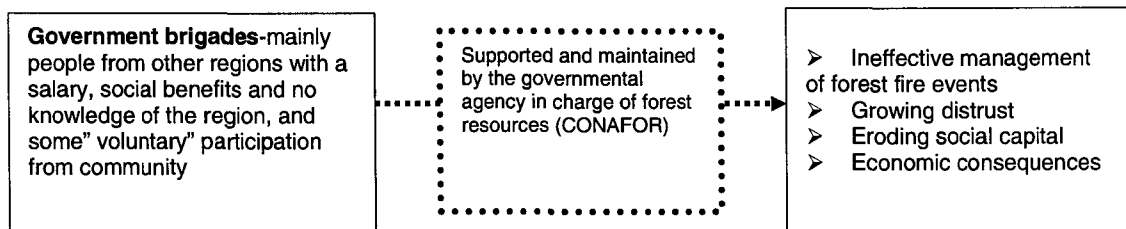
The first two weeks of the 1998 fires were managed and controlled by community brigades without any official support (as food, boots, spray backpacks, lamps, radio communication equipment, tools, helmets and masks). Official support came later, in the form of fire-fighters from the outside, but still in that moment,

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<sup>49</sup> As mentioned before, budget shortages are common at the federal/ ministry level, although this situation is expected to improve under the decentralization program currently in process that is supposed to transfer greater functions and more important, funds to the state and local level.

almost half of the fire-fighters were male volunteers from the communities (Ament 1999).

Governmental institutions with responsibilities to reduce fire risks have been searching for alternatives to the conventional system (Figure 7.3), including joint efforts between official (governmental) and community brigades, as was the case within the Chimalapas region during and after 1998 fire events. Experience in the Chimalapas region with 1998 forest fire events showed that to be successful any effort towards prevention and control of forest fires must be a constant and continuous process where communities are a central active part and must be engaged in all the activities (Figure 7.4).

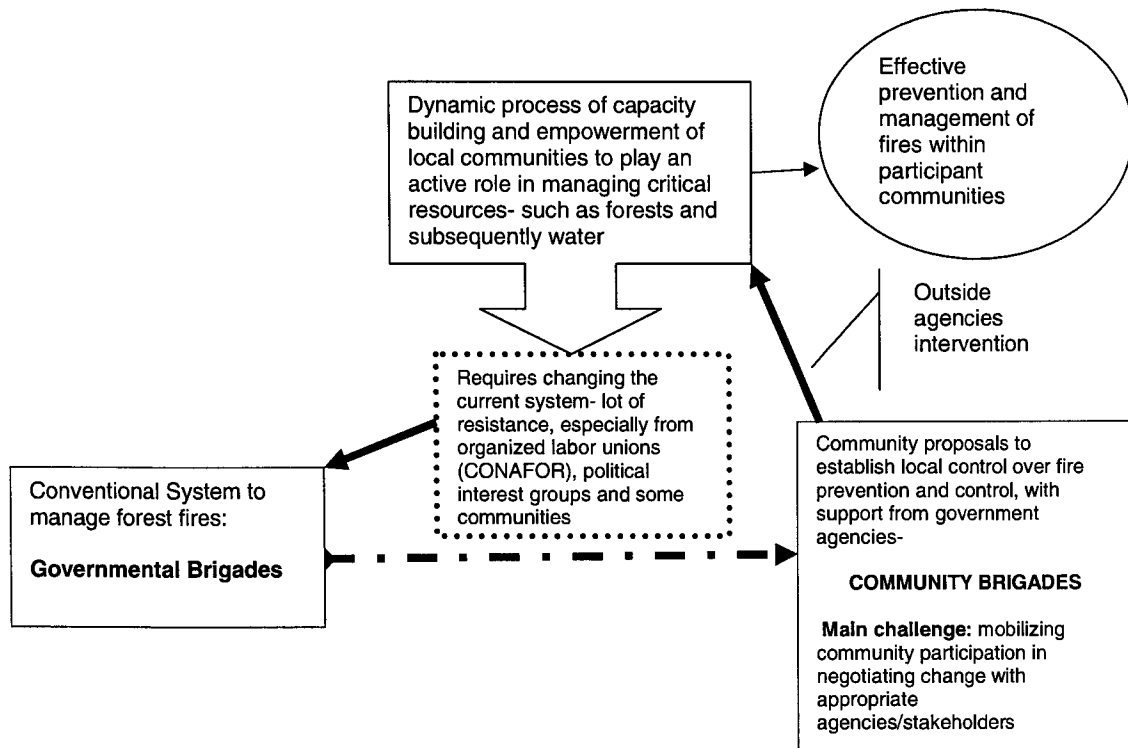


**Figure 7.3 Conventional system to manage forest fires**

The Chimalapas communities considered that ineffectiveness<sup>50</sup> of official brigades was mainly because fire fighters came from distant places (sometimes from Oaxaca but sometimes farther away), did not have enough experience and knowledge of the zone and they were not familiar with the geophysical and climatologic conditions of the region. On the other hand, key informants within the communities expressed that community people involved in the brigades, more often than not voluntarily, are not only knowledgeable about the region, but they are the first to notice a fire and to be in the forest trying to control it. Nonetheless, community volunteer fire fighters do not have adequate equipment and tools (built capital) and they do not have training (human capital) nor economical support to their families (financial capital) during the time that they are forced to abandon

<sup>50</sup> Ineffectiveness as official brigades arriving late worsened by the ignorance of fire fighters regarding the topography of the region, their tendency to work only the eight hours assigned and their lack of commitment to resolve the desperate situation.

agricultural activities, which makes their participation difficult. These perceived shortages in built, human and financial capital required outside agency intervention.



**Figure 7.4 GIEMPBI alternative system proposed to manage forest fires: community fire management**

The GIEMPBI project proposal considered not only the weaknesses of the official brigades (Figure 7.3) and the conflict of responsibilities over forest and fire management between federal agencies brigades and local communities' brigades but also the assets of the community brigades (knowledge about the zone, plus their constant presence), taking on the leadership to promote an alternative system: community fire management. The Benito Juarez project of conservation through prevention and combat of forest fires (Figure 7.4) included the concept of local empowerment integrating technical and organizational capacities. This proposal coincided with CONAFOR interests of introducing a new approach for managing the fires.

The core of the proposed alternative fire control system was a negotiation process between communities and appropriate agencies leading to a reinforcement of political, cultural and social capitals. In a collaborative way, proposals included capacity building and appropriate training (human capital), empowerment (political capital) and an alternative source of formal employment with assigned salary (financial capital) to control and prevent fires which lately would have an impact on communities' natural capital (e.g., forests and water) (Figure 7.4). Nonetheless, as government employees, they would give up some control to centralization- a cost of modernization.

### **7.3 Participatory Ecological Research as an Innovative External Response to Forest Fires Events**

The following section will present and analyze the entire GIEMPBI project process within the Chimalapas communities (Appendix 5 offers a timeline of the GIEMPBI project). In 2000, GIEMPBI submitted a proposal to Department for International Development (DFID) UK, for planning a participatory research project with local communities and an external research team to understand ecological and social impacts of 1998 forest fires in the Chimalapas' forests ("Resistance, resilience and change in response to fire in tropical moist ecosystems in the Chimalapas region of Oaxaca, Mexico" 1/00- 3/01).

The DFID-UK proposal was approved, funding a series of workshops and meetings with the municipality of San Miguel Chimalapa and 17 out of the existing 20 villages as well as an exploratory field assessment of the burned cloud forest areas with active local participation in the collection and dissemination of the information. After the selection of the pilot communities GIEMPBI started planning through participatory workshops the community sustainable productive projects. These activities comprised phase I of the project, the project proposal period. Table 7.3 provides a summary of main activities and results from this phase of the project.

**Table 7.3 Main activities, products and results from project Phase I (2000)**

Activities	Results
<ul style="list-style-type: none"> <li>- Workshops /meetings with the community of San Miguel de Chimalapa (Municipality and 17 villages)</li> <li>- Negotiation for the selection of four pilot communities</li> <li>- Participation in community assemblies to explain the project</li> <li>- Planning workshops with pilot communities seeking the integration of the project within community interests</li> <li>- Jointly planning/visit to the burned places</li> </ul>	<ul style="list-style-type: none"> <li>- Four pilot communities actively involved in the project</li> <li>- Construction of Social Capital (inside the communities, between communities and researchers and institutions, among outsiders)</li> <li>- Horizontal and transparent process</li> <li>- Balance between environmental and community components "Healthy communities: Healthy forests"</li> <li>- Application of the concepts of a Participatory Action Research</li> </ul>

Phase II of the project in year 2001, funded by Global Environmental Fund-United Nations Development Program (GEF- UNDP) PDF-A<sup>51</sup>, and Iowa State University Council for International Programs (ISU CIP)<sup>52</sup>, was comprised of a series of participatory workshops with the four selected villages to jointly develop the community projects or community productive proposals to submit to different potential sources of funding, planning exchanges between Oaxaca team and ISU team as well as workshops for community capacity building in all the pilot communities (Los Limones, Las Conchas, Benito Juarez and San Antonio). Table 7.4 provides a summary of main activities and results from phase II of the project.

<sup>51</sup> "Impact assessment of anthropogenic fire and the development of an integrated ecosystem management model in the tropical forest regions of Los Chimalapas, Oaxaca, Mexico" (6/01- 6/02).

<sup>52</sup> "Confronting global challenges of sustainability through interdisciplinary collaboration in natural resource management between Iowa State University and the Technological Institute of Agriculture of Oaxaca Mexico" (6/01-6/03).



**Table 7.4 Main activities, products and results from project Phase II (2001)**

Activities	Results
<ul style="list-style-type: none"> <li>- Strong period of negotiation and bridging, between communities, between communities and external researchers, between communities and institutions, between researchers and institutions.</li> <li>- Continuation of participatory workshops with the four selected villages to reach an acceptance of the project</li> <li>- Participatory workshops in the four selected communities to jointly develop productive proposals to submit to different potential sources of funding</li> <li>- Preliminary survey of cloud forests affected by forest fires</li> <li>- Design of research and development of a participatory methodology to evaluate/assess ecological and social impacts of forest fires</li> </ul>	<ul style="list-style-type: none"> <li>- Regional coordination of conservation efforts between GIEMBPI team and other institutions</li> <li>- Collaborative agreement signed by all the stakeholders: educational institutions, Municipality of San Miguel Chimalapa, local communities, governmental agencies, non governmental organizations</li> <li>- Submitted proposals for community projects (Table 7.2)</li> <li>- Local participation and capacity building in the field</li> <li>- Community teams trained and participating in all stages of the project: planning workshops as well as collection of data in the field (representatives from municipal authorities and committees from the four communities- at least two members from each community)</li> <li>- Development and distribution of an informative handout on project activities</li> </ul>

A very important outcome of the planning period was the balance between environmental and community components within the global project submitted to GEF-UNDP for funding, reaching the shared vision between participant institutions and communities of “Healthy Communities= Healthy Forests” (Figure 7.5). Each one of the components, ecological, sociopolitical and the SNRM was considered equally relevant and interdependent within the project. Key outcomes achieved during the planning period (phase I and II 2000- 2001) and my interpretation of their relation with the community capitals are summarized in Table 7.5.

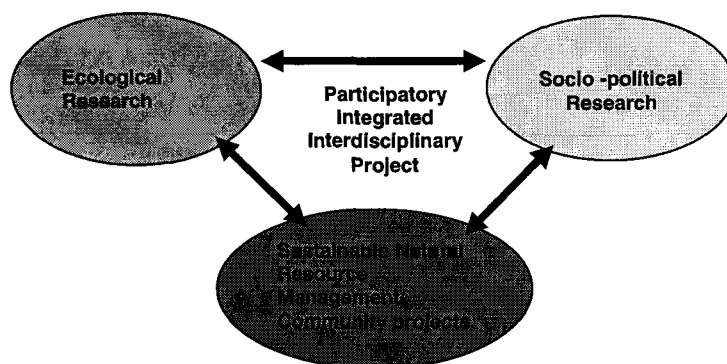
**Table 7.5 Interpretation of relationship between key outcomes of planning period (2000- 2001) and the community capitals.**

<b>Main Outcomes of the planning period</b>	
<b>Natural</b>	<ul style="list-style-type: none"> <li>- Fire-affected cloud forests surveyed, research sites identified, and research design and participatory methodology for assessing ecological and social impacts of the fires developed.</li> <li>- A bulletin on project activities and preliminary ecological results developed and widely distributed among San Miguel Chimalapas communities and institutions participating or having interest in the project<sup>53</sup>.</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>- Construction of social capital among participant communities (San Miguel Chimalapas authorities and Las Conchas, Los Limones, San Antonio and Benito Juarez) and interested external institutions (bonding, bridging and linking social capital).</li> <li>- Coordination of conservation efforts in the Chimalapas region between project team, local government agencies and non-profit organizations enhanced through joint participation in synergistic activities (e.g. informational meetings, community workshops, field assessments, etc.).</li> <li>- Collaborative relations between faculty from ISU and ITAO strengthened through exchange visits and joint research development (funded by Iowa State University's Council on International Programs).</li> <li>- Memorandum of Understanding on Research and Education established between ISU and ITAO.</li> <li>- Agreement on Collaboration established and signed by all project partners- from now on stakeholders-: Universities (Iowa State University, Technological Institute of Agriculture of Oaxaca, Institute for Development Studies-University of Sussex- IDS US, Swedish University of Agricultural Sciences SLU), San Miguel Chimalapa municipality, local communities (Benito Juarez, San Antonio, Los Limones and Las Conchas), government agencies, and non-government organizations.</li> </ul>
<b>Human</b>	<ul style="list-style-type: none"> <li>- Project committees formed in each community, with primary responsibility for proposal development, coordinating activities and communication between the community and project team, and leading field assessments related to the community productive projects<sup>54</sup>.</li> <li>- Local participation and capacity building in the field: community teams participated in all forest assessment activities, received training in data collection and mapping techniques, and responsible for regularly informing the community about the activities and results of the survey<sup>55</sup>.</li> </ul>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>- Recognition in the memorandum of understanding of the importance of local knowledge</li> </ul>
<b>Political</b>	<ul style="list-style-type: none"> <li>- Recognition in the memorandum of understanding of the communities' authorities and power structures.</li> </ul>
<b>Financial</b>	<ul style="list-style-type: none"> <li>- Proposals for four pilot community projects on alternative sustainable productive systems identified and developed through a participatory planning process (Table 7.2)</li> <li>- Full medium-sized project brief to GEF/UNDP Biodiversity Program (section: Mountain Ecosystems) submitted in December 2001 ("Community montane ecosystem management model for the tropical forest regions of <i>Los Chimalapas</i>").</li> </ul>

<sup>53</sup> "Evaluación de los impactos ecológicos y sociales de los incendios de 1998 y desarrollo de proyectos comunitarios piloto en San Miguel Chimalapas. Primera etapa mayo 2000- diciembre 2001". Grupo Interdisciplinario para el Estudio y Manejo Participativo de Bosques e Incendios. GIEMPBI.

<sup>54</sup> Community committees were key in the participatory workshops to prepare the community proposals included within the project submitted to GEF-UNDP as well as in the activities related with community productive projects.

<sup>55</sup> Community members active in the ecological committee reporting to the community during an assembly.



**Figure 7.5 GIEMPBI Project approach: “Healthy communities= Healthy forests”**

Due to financial constraints, attributed to the impossibility to securing funds to move ahead with the social and productive components of the project, aggravated by the constantly fragile political situation (especially in Las Conchas and Los Limones, communities that have a strong presence of political parties and internal division), following completion of the planning period, GIEMPBI continue maintaining a presence in only two out of the four initially selected pilot communities, Benito Juarez and San Antonio (phase III).

Within the existing financial and logistical constraints, significant progress was achieved in implementing some components of the ecological research, as well as modest progress in the community productive projects (phase III). Main advances and outcomes achieved during the post-planning period, year's 2002- 2003 (Phase III), and my interpretation of their relation with the community capitals are summarized in Table 7.6. All the activities in the post-planning period were supported by diverse national and international funding sources including: PROCYMAF-CONAFOR<sup>56</sup>, WWF- Oaxaca Office<sup>57</sup>, FMCN<sup>58</sup>, SLU<sup>59</sup>, ISU-CIP<sup>60</sup>.

<sup>56</sup> Ecological research on effects of fire in cloud forests and community field course on ecological principles and applications to ecosystem management.

<sup>57</sup> Participatory project evaluation and planning.

<sup>58</sup> Community participation in fire management and forest conservation: capacity building and research on fire ecology, prevention, and control.

<sup>59</sup> Field visits by faculty and students and laboratory analysis of soils.

<sup>60</sup> Strengthening research collaboration through faculty and student exchange visits between ISU and ITAO/Oaxaca.

**Table 7.6 Interpretation of relationship between key outcomes of post planning period (2002-2003) and the community capitals.**

<b>Community Capitals</b>	<b>- Main Outcomes of the post planning period</b>
<b>Natural</b>	<ul style="list-style-type: none"> <li>- Overview of project experience in the Chimalapas published in the World Wildlife Fund's bulletin: "Fire in moist tropical forests A preliminary evaluation of the effects of the 1998 fires in cloud forests of Chimalapas, Oaxaca."</li> <li>- Presentation of preliminary lessons learned during the experience at the II International Symposium on Biodiversity: "Biodiversity as a source of development". Cali, Colombia. October 9-12, 2003.</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>- Social research component on community participation and organization related to alternative productive systems and fire management (PAR) formulated by social science researchers, resulting in the initiation of a PhD thesis project by a Sociology student at ISU in May of 2002 and continuing through 2005.</li> <li>- Continuous collaboration between research institutions (ISU, SLU, ITA)</li> </ul>
<b>Human</b>	<ul style="list-style-type: none"> <li>- Local community members (from Benito Juárez and San Antonio) trained in ecological survey and ecological data collection techniques, and participated in the selection of the field sites, collection of data and samples (soil and botanical), preparation of samples, and some preliminary analysis of data.</li> <li>- Ecological participatory field research on the effects and recovery processes in burned tropical cloud forest ecosystems conducted jointly between community research committees and GIEMPBI technical team (establishment and collection of data of nine permanent research plots on karst and metamorphic substrates, and collection of baseline data on species composition, structure, above- and below-ground biomass, soil characteristics, and assessment of fuels and fire risk).</li> <li>- Community capacity building course on ecological assessment of fire-affected cloud forests and application of knowledge to community-based initiatives for fire prevention and control and natural resource management<sup>61</sup>.</li> </ul>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>- Local knowledge included in the selection of ecological research field plots</li> </ul>
<b>Political</b>	<ul style="list-style-type: none"> <li>- Results from participatory assessment of the experience (Participatory Evaluation workshop, January 2003) shared with community authorities and State agencies.</li> </ul>
<b>Financial</b>	<ul style="list-style-type: none"> <li>- Implementation of specific components of community productive projects achieved through participation of ITAO: capacity building in organic agriculture and agroforestry.</li> <li>- Ecological committee participants earning a wage</li> </ul>
<b>Built</b>	<ul style="list-style-type: none"> <li>- Implementation of specific components of community productive projects achieved through participation of ASPRO Water and Solidarity for Progress: field demonstrations of small-scale irrigation systems using drip technology.</li> </ul>

Although the above outcomes (Table 7.6) represent modest gains within the overall project vision, they were extremely important in maintaining project continuity with the local communities and strengthening the project team's operational capacity and relations with other institutions and organizations in the region. Consequently,

<sup>61</sup> "Basic concepts of forest ecology, cartographical and ecological techniques for the knowledge of the forest biodiversity of San Antonio an Benito Juárez Communities' forests, San Miguel Chimalapa, Oaxaca" October 21- 24 2002

GIEMPBI was in a strong position to successfully begin working towards the stated project goal of promoting the conservation of ecosystem processes and biodiversity and sustainable use of natural resources in Chimalapas watersheds containing tropical moist forest ecosystems affected by fire, through the development of community-based model systems.

The year 2004 started with a series of negotiations and planning activities with potential (Oaxacan Fund for Conservation of Nature, FOCN, *Fondo Oaxaqueño para la Conservación de la Naturaleza*, Consultancies and Agro environmental Services, Civil Association, CONSERVA A. C., *Consultorías y Servicios Agroambientales*, *Asociación Civil*, Master Conservation Plan for the Chimalapas -*El Plan Maestro*) and existing (SEMARNAT, CONAFOR, IEEO, CI, FMCN) partners as well as with participant communities in order to strengthen relationships.

The main objectives of these activities were to negotiate and plan collaborative partnerships with WWF and CI (USAID-funded project), including developing of a plan of activities, responsibilities, and funding arrangements which would enable implementation of most of the community projects and seeking potential funding opportunities (FMCN, FOCN) that could reinforce GEF-UNDP 2001 submitted proposal. Moreover, in order to achieve progress on the social and productive components of the initial proposal, it was very important to consolidate the GIEMPBI project team. This consolidation included constant internal project monitoring to assess progress, identification of local advisors for ISU graduate students (ITAO, CONAFOR, others), identification of social research counterparts, and strengthening NGO participation in project field operation, especially related with SNRM projects (e.g., CONSERVA A.C.).

In March (2004), GIEMPBI presented the results from the ecological research, "Ecological effects of the 1998 forest fires in tropical montane cloud forests in the Cordón el Retén in San Miguel, Chimalapa, Oaxaca" (*"Evaluación de los impactos ecológicos de los incendios de 1998 sobre el bosque mesófilo de montaña en el Cordón El Retén en San Miguel Chimalapa, Oaxaca."*) to the two participating communities, Benito Juárez and San Antonio. Key institutions related with the

project, governmental and non-governmental, as well as community authorities were invited to the presentation in San Antonio's communal house. A full document with the ecological results was handed out and the communities and GIEMPBI project team jointly planned a follow-up visit. The main goal of the follow up meeting was to jointly analyze project results presented to the communities, authorities and different institutions (fire research and systematization/social research) and discuss future plans (especially four ISU graduate student projects, and funding/project status).

At the institutional level, GIEMPBI led a series of organizational meetings in Oaxaca City to develop a plan for collaboration in key project activities, to discuss project development and implementation of graduate student involvement within the global project and to consider integration of graduate students within a USAID project with partner organizations (CI/ WWF). These activities reinforced the already existing collaborative arrangements and maintained GIEMPBI's social capital.

GIEMPBI considered the follow up meeting in each of the two communities and with municipal authorities in San Miguel Chimalapa as an opportunity to enhance mutual understanding of community assets (natural, social, human, cultural, political, financial and built) and the potential to improve and diversify sustainable livelihood options through the community productive projects, using participatory action research proposed at the beginning of the project. GIEMPBI's focus was on making connections among the concepts of sustainability, resilience in response to change, risk reduction, social capital, coalition building, and partnership/co-responsibilities between communities and GIEMPBI. The idea was to apply outcomes of these participatory meetings to jointly develop ISU graduate students' research projects (Participatory Action Research) in the areas of agroforestry, agriculture, and forest management, integrating biophysical and social aspects as appropriate. The meeting was also to prepare visits to field sites (e.g., , agricultural fields, forest areas, individual homes) as a basis for assessing current conditions and developing a preliminary work plan for establishing demonstration projects and/or conducting field evaluations and to establish agreements between

communities and ISU graduate students for conducting participatory research projects in the summer of 2004, including specific objectives and responsibilities.

During the follow up meeting with San Antonio, it was possible to conduct a focus group with the community ecological committee (Appendix 2). Participants in the focus group included three members of the original committee, one member that had joined the team recently (and was trained by his own son in-law, who was one of the senior members of the committee) and GIEMPBI's principal investigator. The main objective of the focus group was to analyze the ecological project and the perspectives for the future. Participants were encouraged to share with the group what they had learned from the project, what they contributed to the project, and their vision for the uses of the experience, as well as to ask the principal investigator questions or express doubts. Most of their expressions were related to the contributions of the project to building their human capital: skills, which contributed to their increased self-esteem, but also with the modernization process triggered by the project: knowledge and the importance of formal education (reading and writing). My interpretation of the relationship of some of the responses from the community committee focus group with the community capitals is included in Table 7.7.

For people like me... I do not know how to write nor to read well, but I know how to collect data in the plots and could train others... And that's important for my self esteem.

*Pues para gentes como uno... Yo no se leer ni escribir bien, pero se coleccionar los datos de las parcelas y pude entrenar a mi compadre y a mi suegro... y eso es importante para mi autoestima"* (R. Young male from S.A. participating in a focus group to evaluate GIEMPBI Project. March 2004).

To me the project awakened something; I did not know how to see the forest. Now I have an experience, now I have knowledge and can share with others within my community

*Para mi el proyecto me despertó algo, yo ni sabia como mirar la montaña. Ahora he agarrado una experiencia, ahora tengo un conocimiento y puedo demostrar a otros para que ellos también vayan conociendo"* (RA. Young male from S.A. participating in a focus group to evaluate GIEMPBI Project. March 2004).

The first time that I went to the plots with the team, I thought that because I do not know how to read, I could not learn anything about the forest, but yes, I

learned how to measure the small trees. I also learned how to measure small trash<sup>62</sup>. Sure that I learned a little because I joined the team just recently...I also learned the importance of working together... [The importance] of protecting each other when we are in the forest.

*Yo cuando subí al bosque con el comité no sabía leer, y por eso pensé que no podía aprender nada del bosque, pero sí, ahí aprendí un poco de medir los arbolitos pequeños. También aprendí a medir la basurita pequeña. Claro que aprendí poco porque yo entre a lo último. Una cosa que yo aprendí fue la importancia de trabajar juntos...de cuidarnos cuando estamos en el bosque, para que no le vaya a pasar nada al compañero (S. Mature male from S.A. participating in a focus group to evaluate GIEMPBI Project. March 2004).*

After the biologist left, I was in charge of collecting data. I went three times by myself to the forest to collect the data, and the one who accompanied me [other young man from the community: RE] learned quickly, so I broke the group in two, in order to speed up the collection of data.

*Después de que Rafa se fue, yo quede encargado de coleccionar los datos y fui como tres oportunidades solo. Yo les andaba enseñando todos los trabajos, porque ellos no sabían como coleccionar los datos y después de que yo me quedé solo ahí el que andaba mas pegado conmigo era mi compadre Reydavid y él fue el que le agarró más pronto y yo le dije, bueno, pues entonces usted ya le agarró, entonces ahora le voy a dar su paquete, dividámonos el grupo, usted va con un grupo y yo voy con otro para avanzar mas pronto (R. Young male from S.A. participating in a focus group to evaluate GIEMPBI Project. March 2004)*

Their advantage is that they know how to read and how to write and any data, they take notes... on the amounts that they measure... All that, they write down. The problem to be a leader of a group to me is that I do not know how to read, and then you have to abuse the computer [pointing at his head]... You have to record everything [referring to using the memory].. This is the only way I know how to work. Why? Because I do not know how to read nor to write and for them it was easy because they were constantly taking notes [referring to the two members of the community leading the ecological committee].

*La ventaja de ellos es que saben leer y cualquier dato, pues ahí lo apuntan... que cantidad midió? Y todo eso lo apuntan. El problema para liderar un grupo sería yo, porque pues yo no sé leer y es que hay que maltratar a la*

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<sup>62</sup> In this part of the focus group I expressed my ignorance about what "small trash" meant and the senior member of the committee (the youngest in age) replied, "He was referring to *dead wood* (e.g., *forest debris*). We measured five meters of dead wood which we called solid, intermediate and rotten". This was maybe the most important moment of the whole project to me as a sociologist, an illiterate young man having the confidence to reply in front of two outsiders (women and one of them the respected *Dr.*- PI of the project) using technical terms, which for me was obvious he understood and had the self-confidence to teach others.



*computadora [señalándose la cabeza].. Hay que recurrir a la grabación [refiriéndose a la memoria]... Yo solo así sé trabajar. Porqué? Porque yo no puedo leer ni escribir y a ellos se les facilita porque cada ratito estaban apuntando [refiriéndose a R y RE, los dos líderes del comité ecológico] (S. Mature male from S.A. participating in a focus group to evaluate GIEMPBI Project. March 2004).*

After the focus group, the San Antonio ecological committee discussed with GIEMPBI the possibilities of preparing a proposal to get funding and start a restoration project in the burned areas. The situation positively surprised the GIEMPBI team, because they considered it a response from the community to the work conducted jointly during more than two years of the ecological research<sup>63</sup>

In May 2004, with the first approach to the communities and local institutions started in January and reinforced in March, ISU graduate students along with the principal investigator of GIEMPBI project traveled to Oaxaca to start the research projects. The GIEMPBI group was invited by the general coordinator of FOCN and SEMARNAT delegate to actively participate in the Chimalapas Master Plan meetings in Oaxaca. During the meetings, participant institutions recognized and expressed relevance of knowledge produced in the research activities led with a participatory approach by GIEMPBI as well as their willingness to continue collaborating in GIEMPBI initiative and efforts.

Following a series of meetings in Oaxaca City with different institutions and key stakeholders within the project, the GIEMPBI team, including ISU graduate students, attended community assemblies in participant communities (Benito Juarez and San Antonio). In the assemblies, the communities expressed concern about students' presence and denied permission to conduct any research during the summer time as planned at the beginning of the year. This situation forced ISU graduate students to change plans, resulting in two students changing their research site (ecological and sustainable livelihoods studies) and the other two changing the

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<sup>63</sup> The ecological restoration proposal was included within a project submitted in May 2004 by GIEMPBI to FMCN (funds that were not granted but considered by GIEMPBI as an important step forward within the community committee)

research approach from totally participatory to a more theoretical analysis (forest products market study and my sociological analysis of the research process).

One month after the assemblies' denial of permission to conduct participatory research, the municipal authorities sent the GIEMPBI group a letter explaining the delicate political situation within the region (gubernatorial elections), highly exacerbated by agrarian conflict, as a justification for their reluctance to permit presence of external researchers (Appendix 6).

Looking back to the series of events that happened soon after we left the communities, one cannot deny the truth of what the authorities expressed in the letter. They were trying to protect GIEMPBI project team. A few days after we left the communities, men from San Antonio and Benito Juarez, along with municipal authorities and members of two other villages, conducted a blockage of the gravel road that leads to their villages. The situation turned violent and required the intervention of police and public force. Few weeks after that, Oaxaca was shocked with the news that an active member of Santa Maria Chimalapas was assassinated in Juchitan. What is worse is that the first news erroneously mentioned a San Miguel Chimalapas leader as the victim. Recently, April 2005, we got more sad news. One of the Benito Juarez members, an active person in different ecological and conservation projects and lately a staff member of CONANP was assassinated. The bloody events happening soon after the refusal of the communities to permit our presence make me think that they were sincerely protecting GIEMPBI team from the events that they did in fact foresee.

The last phase of the process- implementation phase- resulted in a set of outcomes that along with my interpretation of their relation with the community capitals are summarized in Table 7.7.

**Table 7.7 Interpretation of relationship between key outcomes of implementation period and the community capitals.**

Community Capitals	- Main Outcomes of the Implementation period
<b>Natural</b>	<ul style="list-style-type: none"> <li>- Communities and institutions have a first document/technical report with results from the ecological research.</li> <li>- Publication of the first papers of the ecological research: one in press: Journal of Tropical Ecology and one in preparation to be submitted to Biotropica (both peer reviewed journals).</li> <li>- A published chapter of a book: "Effects of the 1998 fires on tropical montane cloud forests; Chimalapas, Oaxaca". In: Villers-Ruiz, L., G. Lopez-Blanco, <u>Forest Fires in Mexico: Methods and Evaluation</u>. National Autonomous University of Mexico: Mexico City. Pp. 125-146.</li> <li>- Presentations of ecological results in different scientific events: Ecological Society of America 89<sup>th</sup> Annual Meeting, Portland, OR, 1-6 August, 2004, and XVI Congress of the Mexican Botanical Society, Oaxaca, Mexico, 17-22 October, 2004.</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>- Intense and active negotiation process to get resources and to maintain a continuous presence within the communities and institutions, leading to a broader set of contacts and connections.</li> <li>- Members of the community ecological committee expressing the importance of working together as an organized team.</li> <li>- Authorities refusal to allow GIEMPBI team to be in the communities during summer 2004 that now (looking back) I interpret as an expression of social capital. Communities knew what was going on and were trying to protect project team as mentioned in the letter: "and for the sake of your team we suspend activities until the conflict is solved" "<i>Y por seguridad de su personal reiteramos el inicio de sus actividades hasta que se resuelva el conflicto</i>" (Appendix 6)</li> </ul>
<b>Human</b>	<ul style="list-style-type: none"> <li>- Presentations of social results sent and accepted at XXII IUFRO World Congress, Brisbane, Australia, August 2005 and VI Latin-American Symposium on Research and Extension in Agricultural Systems, Manizales, Colombia, July 2005 (<i>VI Simposio Latinoamericano sobre Investigación y Extensión en Sistemas Agropecuarios, IESA-AL</i>)</li> <li>- Members of the community ecological committee trained other community members on the collection of data for the ecological project</li> <li>- Recognition within the community committees of the importance of the project for their knowledge about the forest</li> <li>- Recognition within the community committees of the importance of the project for their self-esteem</li> <li>- A community proposal (prepared by ecological committee) to prepare a restoration project and to look funding for it presented during a meeting with PI GIEMPBI</li> </ul>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>- Persistence, in the communications of some community leaders with GIEMPBI, of the expression "We the Zoque people".</li> </ul>

Table 7.7 (Continued)

Community Capitals	- Main Outcomes of the Implementation period
<b>Political</b>	<ul style="list-style-type: none"> <li>- Demanded presence (by the communities) and recognition (by main institutions) of GIEMPBI in different forums of discussion in relation with ecological and social issues within the Chimalapas region (e.g., Chimalapas Master Plan, <i>Plan Maestro</i>).</li> <li>- For the first time in my two years of presence in some assemblies I witnessed community members actively defending GIEMPBI in front of the assembly attendees<sup>64</sup>.</li> <li>- Communities trying to use GIEMPBI influence to get presidential attention to the agrarian situation (Appendix 6)</li> </ul>
<b>Financial</b>	<ul style="list-style-type: none"> <li>- Community ecological committee reporting an income because of their participation in the project</li> <li>- Community members participating in the fire brigades with an assigned salary</li> </ul>

As observed in Table 7.7, the main outcomes from the implementation phase of the project are related to natural, social, human and political capital. There are few outcomes related to cultural and financial capital and none with built capital. My interpretation of the concentration of outcomes especially in the natural, and human capitals is that the only sources of funds were for the ecological aspect of the GIEMPBI project, leaving behind cultural, financial and built capitals compromising (“decapitalizing”) the premises of a healthy community (Flora et al., 2004: 9).

<sup>64</sup> The most interesting fact was that it was not only the members of the ecological committee defending GIEMPBI in front of the assembly (for the first time standing up for *their* project) but some other community members well known by being “trouble makers” within the assemblies also defended the project

## **CHAPTER 8. FACTORS AND PROCESSES CONTRIBUTING TO THE BREAKDOWN/FALL OF THE PARTICIPATORY PROJECT**

Many factors possibly played a part in the disruption and discontinuation of the GIEMPBI process within the communities. In the following sections I will elaborate on the most visible ones, acknowledging not only that there is intermingling among the factors but also that there are certainly many other factors that could have had an important role.

### **8.1 New Authorities**

One of the challenges to working within the Chimalapas communities is the existing power structure at the municipality and community level. Some villages base all community decisions on the consensus model (e.g., Benito Juarez and San Antonio), while others have started using the majority model to make decisions and in some of them there is now the undeniable presence of political parties and their factions (Los Limones and Las Conchas among others). These changes complicate matters, as any negotiation with outsiders will not be based on the interest of the community as a whole, but influenced by partisan groups within the communities. But the differences within decision-making structures are not the only factors that complicate social processes with the communities. There is also the awkwardness of mandate periods. Since municipal authorities (municipal president and communal property commissar) are elected every three years, while village authorities (municipal agent and common property auxiliary secretary) are elected every year<sup>65</sup>, the situation forced the GIEMPBI team to constantly negotiate with every newly elected authorities (at municipal and village level) the terms and conditions of the participatory project.

This renegotiation process is very draining to the technical team, as it obliges a joint and continued revision of project goals and accomplishments. In terms of

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<sup>65</sup> As mentioned above, in San Antonio the election is the last assembly of the year, in December, but due to conflicts with an authority elected two years ago, Benito Juarez elects authorities during March assembly.

implications for the communities' political capital, high local representative turnover may have two opposite outcomes. First, it could be positive, because it forces outsiders to constantly check and renegotiate terms and conditions of agreements with community authorities, which ensures that the community authorities have a voice in any process or project with external agents and delays any modernization project. Thus it was very important for the GIEMPBI project to maintain a neutral role (at the margin of any political situation), and insure transparency of information and active communication. It is also incumbent on villages and municipal authorities and to keep records of official agreements (assembly acts, memorandums and communications)<sup>66</sup>.

However, local representative turnover resulted in a discontinuity in the construction of social capital with external institutions (bridging social capital) that in turn rendered a negative effect on the political capital and potential financial and built capitals to the community. Constant re-negotiation sometimes was part of a power game played by newly elected officials and outsiders, which weakened previous efforts in the establishment of a transparent collaborative agreement and could force outsiders into skipping steps within the communities' decision making structures in order to keep up the momentum of some processes (e.g., sometimes approaching the village authorities and at other times the municipal authorities, depending on the political situation of the moment).

## **8.2 Internal Conflicts**

Internal conflicts are ever present within the Chimalapas communities. The issue was mentioned in all the informal conversations with community members, with authorities, and with staff members from NGOs and governmental agencies with experience in the region. Since the GIEMPBI project started working with Chimalapas communities in 2000, community authorities recognized the persistent lack of community organization and the ever-present agrarian conflict and demanded sociological studies. GIEMPBI agreed with the communities to initiate

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<sup>66</sup> As was explicitly stated in the memorandum of understanding.

capacity-building workshops to strengthen community organization (through agreements with CAPLAC, A.C.). These workshops paralleled the participatory workshops for developing community productive projects. However, due to the lack of financial support to fund workshops and activities, it was impossible to give continuity in capacity building. It was expected that my presence (as the sociologist of the project) along with a participatory action research (PAR) would yield a structured monitoring and assessment plan that would assist communities to strengthen their organizational capacities.

When communities demanded sociological studies to help in the solution of the agrarian conflict, GIEMPBI explained that as foreigners the Mexican constitution prevented us (ISU sociologists) from being involved in any political activity (the agrarian situation in Mexico is highly politicized). Instead it was posited by GIEMPBI that the PAR should provide community members with enough tools to make informed decisions on whom to work with and how to form advocacy coalitions around the agrarian situation. The lack of financial support for the project combined with the exacerbated agrarian problem (this last time with Santo Domingo de Zanatepec. See Appendix 6) contributed to the impossibility of implementing PAR and concluding the already initiated sociological analysis that would support the holistic approach of the project.

### **8.3 Paternalistic History**

A long history in the region of paternalistic and clientelistic programs and approaches promoted by both governmental and non-governmental groups (top down approaches associated in many cases with elections, political favors, unfulfilled commitments, resource permits, etc.) created a culture of dependency on external handouts that discourage local initiative, self-organization, and problem solving through internal cooperation. This history of client-patron relationships was mentioned during informal conversations with the medical doctor attending Benito Juarez and San Antonio communities. The doctor used as an example the experience with the toilet bowls brought to the communities as part of one

“development project”. The project handed out toilets in exchange for the communities’ permission to allow the NGO to conduct a series of studies. The project ended “on not exactly good terms... I saw some of the villagers trying to sell the devices and commenting that it was the only benefit they got from the project” (Informal conversation with a male medical doctor July 2004).

Experience in Chimalapas shows that often external programs are not based on sustainable natural resource management models, or even if they are, they are dependent upon continued external support for their success. Initiatives are quickly abandoned once the project leaves the area (an example of the situation was the presence and subsequent disappearance of MPS in some of the Chimalapas villages).

The GIEMPBI approach, trying to surpass the paternalistic and clientelistic approaches, was not well understood by the communities, which were accustomed to always get something tangible (in terms of impacts on financial and /or built capital) in exchange for their participation in any project. That required GIEMPBI to reassure each community in every meeting that GIEMPBI was not planning to come with a solution for all the community “needs” nor with handouts, but instead could help in the construction of strategic alliances (with outside stakeholders) (impacting social and political capital) to jointly find alternatives to the persistent complex ecological (natural capital) and social realities (social, human and cultural capital) of the communities.

#### **8.4 Past Legacies**

Chimalapas communities have a long history of miscommunications and disruption of relationships (social capital) with different governmental agencies (Russell and Lassoie n.d.) and non-governmental organizations (e.g., MPS, SERBO, PRONATURA, SEMARNAP). Interviews and informal conversations with community members consistently mentioned those past failures. The disrupted communications have left behind distrust and weariness, both on the part of



community members and authorities as well as officials and staff members from agencies and organizations (erosion of social capital).

During the community assemblies, there were inevitably a series of accusations towards the GIEMPBI team. The accusations went from biopiracy to extraction of community information to be given to governmental organizations, as well as of profiting from the relationship with the communities. GIEMPBI gave the proper explanations to the questions raised during the assemblies; nonetheless the feelings of distrust periodically arose and were latent in the process.

### **8.5 Links between Research on Natural Resources and a Healthy Community were not clear to Communities**

As mentioned above, Chimalapas villagers included in the GIEMPBI project (Benito Juárez and San Antonio) are products of the so-called “second phase of colonization” (De Teresa 1999, 2001). These two villages have the largest population growth within San Miguel de Chimalapas municipality (Table 4.1) having doubled their population from 1990 to 2000 (human capital). Immigrants from other parts of the country compose most of this new population (cultural capital). They enter the region with all the baggage and lack of connection with the ecosystem (natural capital) that comes with recent arrivals. They also bring in totally different perceptions and approaches from those of the Zoque people regarding the management and use of the communal natural resources.

Most people from Benito Juárez and San Antonio view and perceive the natural resources and the communal lands as sources of financial capital. Their relationship with the environment is more an extractive approach than a model of codependence and co-evolution, as they do not assign the natural capital any spiritual value (cultural capital). Moreover, the fact that they have recently migrated increases the probability that they will migrate out once natural resources are exhausted<sup>67</sup>.

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<sup>67</sup> These suppositions support the need of further studies on migration patterns, considering the fact that in both communities the in-migration is larger than out-migration (INEGI 2000). There is

Once the GIEMPBI project accepted a holistic approach in the planning stages with the communities, it meant that all the community capitals would be addressed, highlighting the importance of integrating contributions and responsibilities and seeking linkages with different outside groups (investments in social capital). In this way the communities could assimilate and own the information regarding negotiation and management of communal resources (political capital). For GIEMPBI, it was very difficult to promote the notion of interdependence between the day-to-day practices and the health of the ecosystem during the participatory workshops to develop the community productive projects. It was also very complicated to make clear to the communities the existent link between a healthy community (with balanced and synergy among the capitals) and a healthy ecosystem (one that provides the community with all the required environmental services) since the communities were very focus on income-producing projects (financial and built capitals)<sup>68</sup>.

### **8.6 A Participatory Approach?**

In the process of signing the Memorandum of Understanding (MoU) (Appendix 4) and during phase I of the project (the planning period), GIEMPBI conducted several activities to explain and highlight the importance of a holistic approach towards sustainable management of the communities' natural resources. This allowed the project to identify the totality of community capitals and generated important outcomes reinforcing most of the capitals but primarily natural<sup>69</sup>, human and social capitals, with modest but important impacts on cultural, political and financial capitals (Table 7.5). As the project evolved and became more a process (of community development) than a project (an ecological project), there was a decrease in the outcomes related to some of the community capitals. Nonetheless

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evidence that the out-migrants are planning to come back as they leave behind the family and their remittances are being used to buy livestock as mentioned above

<sup>68</sup> GIEMPBI was trying to highlight the importance of identify the community capitals and differentiate between investing the capitals, using the capitals and impacts on the capitals, on the community and on the ecosystems.

<sup>69</sup> GIEMPBI first goal was to get scientific information about the impact of fires in remote and unique forest settings

outcomes related to natural, social and human capitals seemed to be favored by the process led by GIEMPBI and outside partners with the majority of outcomes related to natural and human capitals (outcomes related mainly with the ecological research) and with just minimum outcomes related to cultural, political, financial and built capitals (Table 7.6). During this period of the project, communities keep demanding more attention to the community productive projects (political, built and financial capitals), but GIEMPBI did not get the funds to support activities to fulfill the communities' demands. The last phase of the project (implementation period) yielded again important outcomes for natural, social and human capital, as well as some outcomes related with financial capital, and some (unintended) outcomes in relation with political capital (Table 7.7).

As observed in the Tables 7.5- 7.7, different capitals were reinforced through the different phases of the project. However, GIEMPBI was unable to follow up on the productive projects, such as the healthy agriculture and the establishment of permanent community fire brigades, which would have balanced the outcomes by bringing in the additional financial and built capital assets demanded by the communities. There were timid attempts by the communities (supported by GIEMPBI) to write proposals seeking funds from agencies that had initially promised grants to reinforce communities' initiatives. Some other agencies committed funds for community projects that started, but neither the communities nor the agencies followed up (e.g., CONANP's forestry nursery and livestock project in San Antonio).

GIEMPBI's idealism, which included a belief that financial resources to fund productive projects could be found, prevented it from sincerely facing the communities and accepting the impossibility of moving ahead with them. On the other hand, the communities always relied on GIEMPBI to look for funds for the productive projects, and did not seek to assume this responsibility nor did GIEMPBI act proactively to delegate fund-seeking responsibilities to the communities. This unintentionally led to reinforcement of the old clientelism, which both sides slipped into effortlessly.

Along with the difficulty of accessing resources to fund the productive projects, each one of the institutions and stakeholders within the GIEMPBI project had their own agenda that they put above the commitments incorporated into the MoU (Appendix 4). In my perception, some of GIEMPBI partners used GIEMPBI's presence and acceptance within the Chimalapas communities to fulfill their own goals and to reestablish their presence among Chimalapas communities rather than working synergistically towards common goals.

During GIEMPBI's internal meetings, I strongly argued with the ecological team that any new species found was a great opportunity to encourage community participation through the inclusion of the assemblies' voice in the process of naming them. Nonetheless the new species found were assigned a name in the Ecological Institute of Xalapa (by scientists not taking into account the owners of the botanical material), losing a great opportunity to jointly construct knowledge and to truly involve the communities in the ecological research which would have allowed GIEMPBI to confront the perception that community participation was only in the form of labor to gather specimens and to get access to the field plots. In this instance the opportunity to reinforce ownership and empowerment of the communities regarding the botanical information was not pursued completely. On the other hand, drafts of manuscripts were presented and discussed with both communities as well as with municipal authorities, providing an opportunity for input and dialogue, prior to formal publication. Further, results were repeatedly presented in community assemblies (jointly by community and technical team) and all written documents were submitted to communities and municipal authorities for their archives.

Concerning the weaknesses of the participatory approach, I perceived that some members of the GIEMPBI technical team and partners were tempted to not be clear and transparent with the communities, as the limitations to achieving a truly participatory approach became considerably apparent, less desirable alternatives were proposed by partners, thus compromising the clarity and transparency of the project. For example one key partner suggested that it might be better for ISU

students not to appear within the communities connected with GIEMPBI so they could “conduct their research projects and *extract* the information without the obstacles that could arise from being identified with the GIEMPBI project”. During one of the most poignant meetings and difficult times in the relationship between GIEMPBI and the communities, another key partner argued “We must give them the irrigation project,... It will only cost a couple of hundred dollars to give them just some meters of water pipe. They are going to be happy with that, and we will get their permission to collect the ecological data” or even “We can give a donation to the authorities and they will help us in convincing the assemblies to allow us to collect the ecological data”. My interpretation of such comments (and attitudes), that were never accepted by GIEMPBI, is that the complex concept of a truly *participatory approach* was not totally understood or accepted by some of the partners, wearing down the good intentions described in the project documents and not helping in building trust (bridging social capital) between outsiders and the communities, but rather exacerbating frictions, divisionism and distance within the technical team (bonding social capital).

### **8.7 Eroding Social Capital due to External Sources of Funding.**

In a report submitted to GEF-UNDP on the major advances achieved on the project (February 20, 2003) the GIEMPBI team wrote “We point out that our project brief has not yet been reviewed by the GEF panel, apparently due to the unfavorable economic situation within the organization. However, we would like to emphasize that despite this setback, our project team has successfully maintained key project participants and operational activities related to the project within the Chimalapas region through a series of smaller grants, combined with a strategic use of available resources. As a result, we are currently in an optimal position to initiate implementation of the full project on the ground as originally proposed to GEF”.

The delay on the side of the primary potential funder (GEF-UNDP) to give a response, positive or negative, created a growing mistrust on the part of the communities who constantly demanded clarification from GIEMPBI about the

financial situation of the project. Luhmann (1993) mentions institutional risks that are related to the political systems that surround institutions. In such institutions, risk can be transferred from the higher authorities to the subordinates. Subordinates can share their risk assessment with the higher-ranking members of the institutions by once again transferring the problems of risk. The GIEMPBI project suffered the effects of this 'transferred' institutional risk, when a response regarding funding from GEF-UNDP was consistently prolonged, eroding the social capital<sup>70</sup> constructed during three years of joint work (communities, institutions and researchers) introducing negative bridging social capital ("weaknesses of weak ties") (Levitte 2004).

In response to the demands made by the communities and community authorities during the assemblies and meetings, GIEMPBI explained that there was not yet a response from GEF-UNDP, yet remained optimistic that the funds would be approved. However, these positions by GIEMPBI which may be considered excessively naïve and idealistic but which colored expectations within communities led to disappointment and mistrust. For the communities, it was not very clear that a project, developed in a participatory way, including their demands for community productive projects and submitted in year 2001, could have remained in evaluation for more that three years in UN Mexico City and New York offices with no response.

The relationship between GIEMPBI and the Chimalapas villages suffered seriously due to the difficulties involved in justifying the insecure financial situation, the causes of which were unclear even to the technical team. At the same time, this situation forced both the communities and technical team to seek other sources of funding as a response to the risky situation, providing the opportunity to broaden the contacts and start collaborative projects with different institutions (e.g., FMCN, PROCYMAF-CONAFOR).

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<sup>70</sup> Communities, researchers and institutions working together in the ecological research project that at that point had not only active community committees, but also a good amount of information jointly collected and produced and a proposal from the community of San Antonio ecological committee to follow up the process of recovery of the burned areas.

Considering past experiences in the region (paternalistic and clientelistic approaches) I consider that the delay in receiving funds was an advantage. The impact of getting a considerable amount of money could have meant a reinforcement of the communities' views of outsiders as sources of hand-outs, without requiring efforts in the process of dialogue, negotiation and reflection and what is worse, without requiring the construction of a relationship between communities and outsiders based on a shared vision of sustainability and sustainable development. Nonetheless, the fact that the social capital between the communities and external team was so tenuous that the delay in funding contributed significantly to a complete breakdown in relations may be an indicator that even if funding have been provided in a timely manner, a truly participatory approach with shared responsibilities and commitments would have proved impossible under existing social and political circumstances.

In this chapter I attempted to underline some factors that possibly play a role in the disruption of the participatory research led by GIEMPBI. Among many other possible factors, I describe some difficulties within the negotiation process due to local and municipal representatives' turnover which seriously affects communities' decision making structures (political capital). I also describe internal conflicts and lack of community organization (social capital) as having an important part in the discontinuation of the process, as well as past legacies of paternalistic and clientelistic approaches, always bringing hand-outs (financial and built capitals), which accustom the communities to top-down approaches and make it extremely difficult and exhausting to initiate a different approach of co-management and co-responsibilities. Nonetheless, there are expressions of community resiliency and examples of the success of joint efforts to prevail over adversity and prolonged unfavorable situations. Next chapter, my last chapter, emphasizes the possibilities of synergistic activities towards the recovery of a healthy community, and afterward of a healthy ecosystem.

## **CHAPTER 9. POST FOREST FIRE PERSPECTIVE: TOWARDS A MORE INTEGRATED COLLABORATION BETWEEN STAKEHOLDERS**

Earlier in this document I posited a strong positive relationship between the balance and synergy among community capitals and the health of the ecosystem. Based on the analysis of the interviews, project documents and field notes, I constructed a series of models/schematic diagrams demonstrating various aspects of this relationship (Boxes 9.1- 9.8). This chapter highlights how synergistic interactions among the community capitals, catalyzed by the initial imbalance after the 1998 forest fires (the domino effect of shrinking or increasing the community capitals), led to the integrative collaboration of communities and main stakeholders (outsiders), the recovery of community health, and the seeking of a healthy ecosystem. The first section of this chapter addresses how the “spiral up” or “spiral down” effect was manifested for each of the seven capitals. This is followed by an analysis of the synergistic interactions within communities contributing to the rebalancing of the community capitals. Finally, I discuss how the knowledge and experience gained through the GIEMPI project serves to further guide the rebalancing and reconfiguration processes and thus enable the communities to better adapt and respond to new risks, initiated by knowledge itself and the undeniable globalization process, both results and expressions of the risk society (Beck 1999, Giddens 2000).

### **9.1 Spiral Up or Spiral Down?**

An analysis of the impact of a severe ecological disturbance event on the Chimalapas communities shows an impact not only on natural capital, but also on the rest of the community capitals (shrinking of all the community capitals), changing the balance and the configuration among them. The overall health of the community was then severely affected, referred to here as “Spiral Down” or “Downward Spiral” (Figure 9.1).



**Post Fires Period II (2000- 2004): Recovery of Balance/Synergy**

**Natural Capital:** Fewer incidences of human induced forest fires. No reported water scarcity

**Social Capital:** Active communities' committees in joint projects. Alliances with institutions and organizations

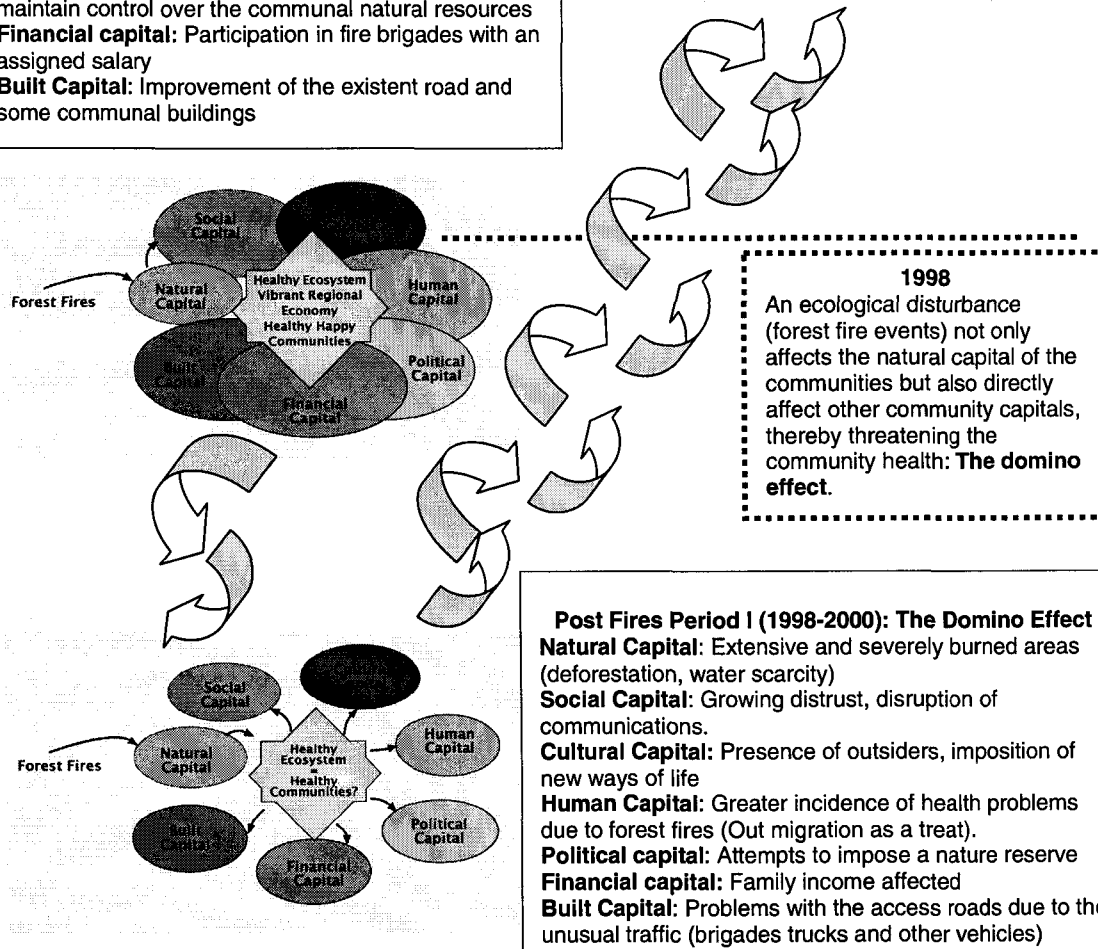
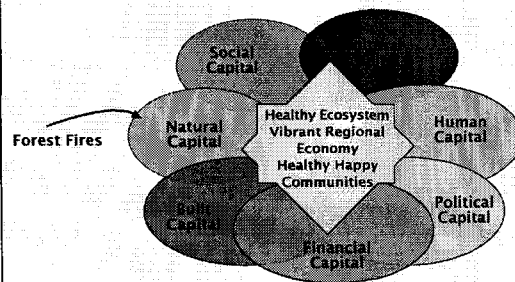
**Cultural Capital:** Acceptance/inclusion of local knowledge (within projects)

**Human Capital:** Young people from the communities attending high school (forestry vocational school)

**Political capital:** Intense negotiation process to maintain control over the communal natural resources

**Financial capital:** Participation in fire brigades with an assigned salary

**Built Capital:** Improvement of the existent road and some communal buildings



**Figure 9.1 Community Capitals Post Forest Fires: Spiral up or Spiral down?**

The Chimalapas communities, as with all communities with scarce resources, can create great synergies among the capitals engendering a spiral up effect that continually builds on the capitals (upward spiral). Conversely each capital can be

attended to separately from the others, reinforcing a general downward spiral. The turning point for sustainable change is then reflected in both the investments of multiple capitals and their interactive and synergistic impact on the different capitals.

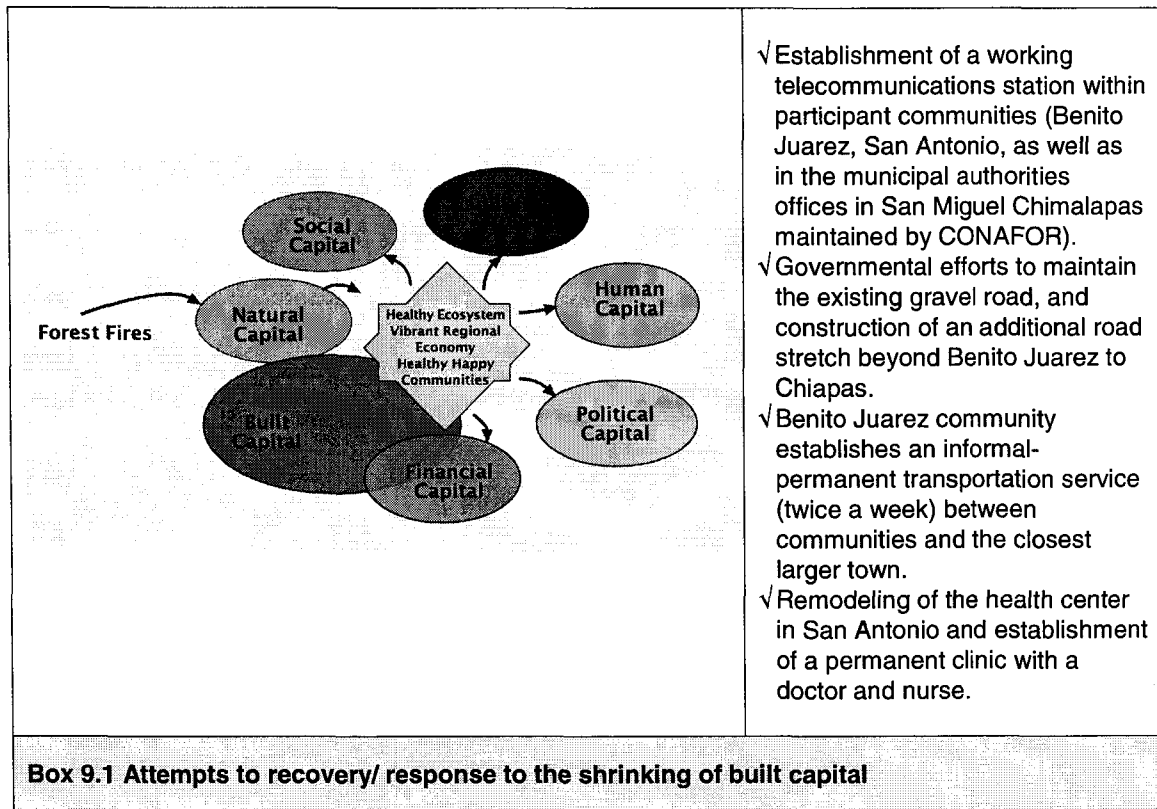
The Chimalapas communities' experience after the 1998 fires illustrates both the negative impact of the forests fires on the community capitals (Post forest fires period I: 1998- 2000) and the positive impact of balanced investment in community capitals to create positive change in response to the fires, where dialogue and reflection lead to the recovery and transformation of all the community capitals in an upward spiral (Post forest fires period II: 2000-2004) (Figure 9.1). Nonetheless, considering that the communities are dynamic systems continuously facing new risks, they are always confronting the possibility of either spiraling up or spiraling down, depending on the capital investment strategies (both between and among the internal and external actors) and the efforts to keep a balance and maintain synergy among the capitals. Below, I analyze the responses within the communities to the reduction in each of the seven capitals during the years immediately following the 1998 fires. Specifically I highlight the recovery from the downward spiral or domino effect (Boxes 9.1- 9.7).

### **9.1.1 Responses to a Shrinking Built Capital**

Despite the fact that the fires happened far from the communities' living zone, the events also shocked communities' built capital. The already neglected gravel/dirt roads, the only access point to the isolated communities, were even further deteriorated by heavy traffic bringing the fire brigades with equipments.

Nevertheless the situation also helped communities and governmental agencies recognize the importance of repairing the gravel road (that connects the communities with the Inter-American freeway), of having telecommunications service within the communities and of providing permanent transportation services. In addition, the need to improve the existing health center in San Antonio (which at the time of the fires the center provided services only twice a month) and to continuously

provide health services was obvious, leading to the establishment of a permanent clinic with an attending doctor and a nurse (Box 9.1).

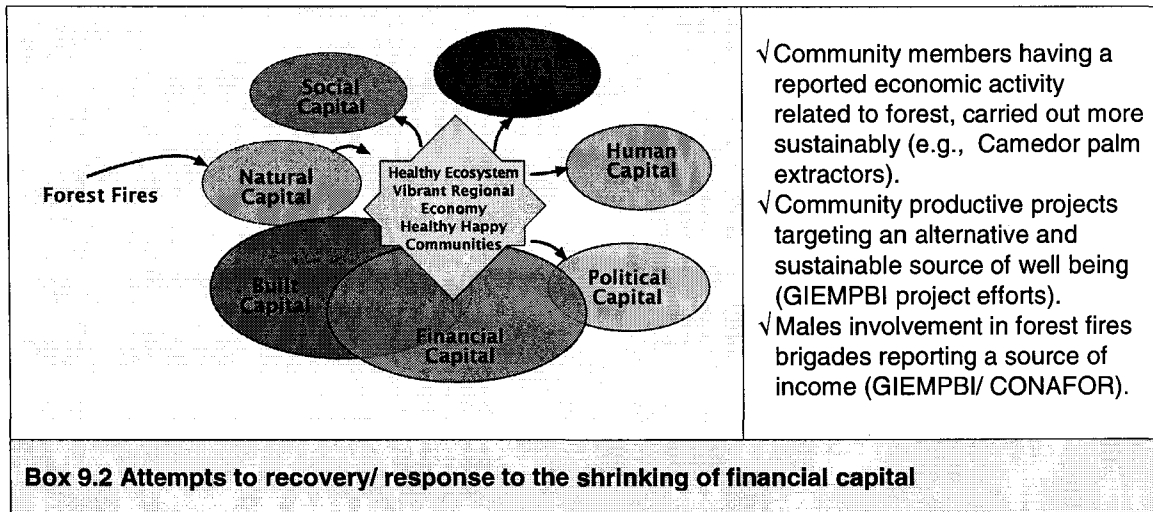


### 9.1.2 Responses to a Shrinking Financial Capital

Communities' financial capital was also severely affected by the 1998 forest fires. Men from the communities voluntarily participated in fire-fighting activities, which kept them from their agricultural labor, reducing and worsening the already low yields due to subsequent water scarcity. Moreover, for those community members with forestry activities (timber and non-timber) the fires affected directly their source of income (1/3 of the communal forest was severely affected by the fires).

Responses from the communities to the shrinking financial capital involved their demands to have access to the same salary assigned to the official brigades, as well as their claims to the GIEMPBI team to consider the community projects as

an important alternative source of income to provide them with a sustainable livelihood (Table 7.2. Box 9.2).



Recognition by outside state agencies and NGOs of the relevance of the communities' involvement in management of natural resources opened the door to funding opportunities in support of the community productive projects (e.g., nurseries, fire brigades training, etc.). This process requires substantial investments in other community capitals (mainly social, and human), but it also has important indirect influences not only on financial capital, but the other community capitals as well.

### 9.1.3 Responses to a Shrinking Political Capital

As in the case of cultural capital, communities' political capital was severely affected by the fires due to the increased presence of outside groups (governmental and non governmental) seeking different types of control over the communities, their resources and their decision-making structures (Box 9.3).

Weber (1947) argues, "Whenever corporate groups which make use of force are also characterized by the claim to territorial jurisdiction, such as a village communities or even some household groups, federations of guilds or of trade unions, they are by definition to that extent political groups" (Pp. 154- 155). During extremely distressing times, community members have been conducting blockages

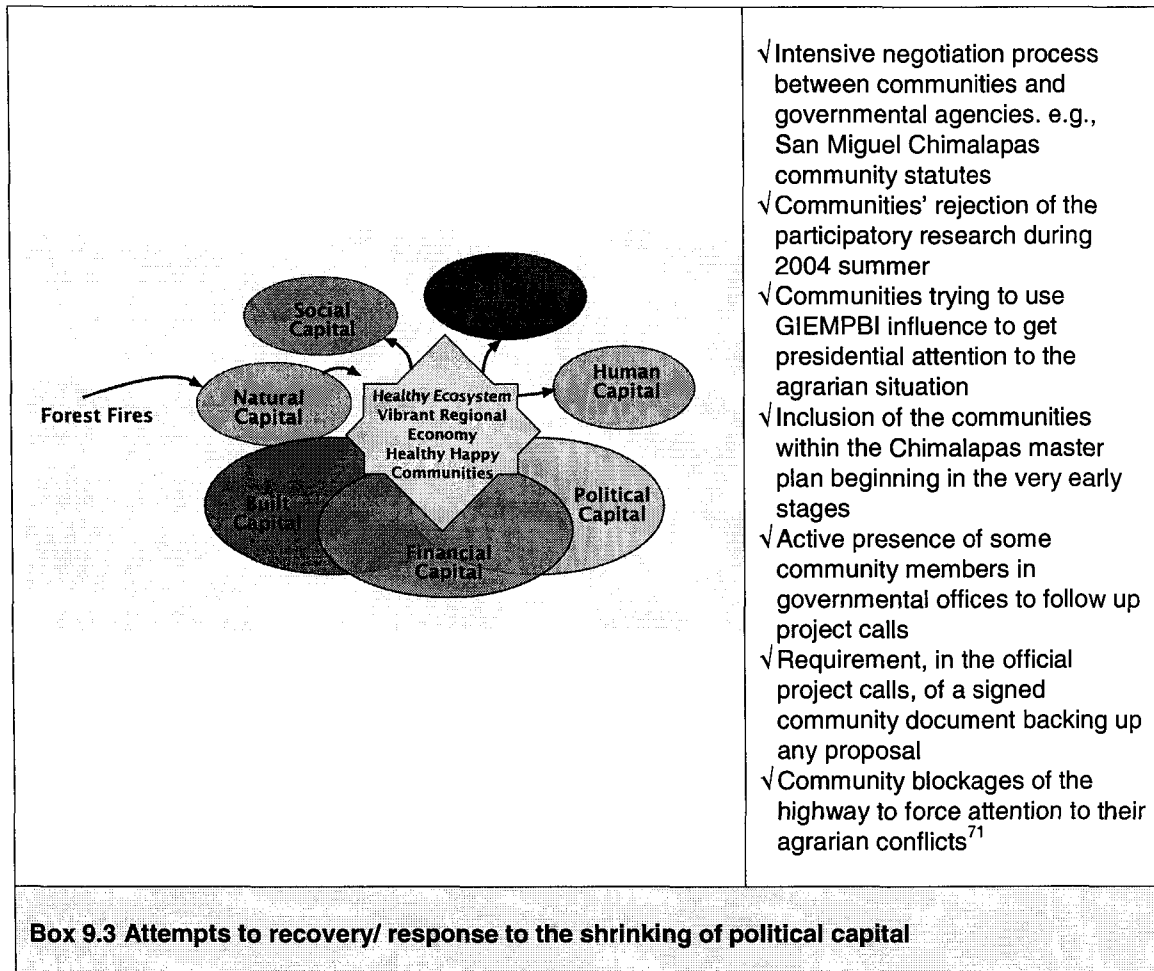
of the road, trying desperately to get the attention and intervention of the authorities in their agrarian conflicts and thus exerting their own political power. During the summer of 2004 (see Appendix 6) the agrarian conflict, exacerbated by the unstable political situation preceding gubernatorial elections, triggered a series of confrontations between eastern San Miguel Chimalapas' villages and Santo Domingo de Zanatepec farmers. Benito Juarez and San Antonio's men, along with municipal authorities, blocked the road in an attempt to move their political capital to get the attention of authorities to help in the resolution of the territorial conflict.

Russell and Lassoie (n.d.) conducted a study within Chimalapas communities to understand the importance of conflict management in biodiversity conservation and the application of lessons learned on a large scale. The authors argue, "Despite the mistrust of the government, the study found a contradictory dependence by the communities on the government to resolve conflicts" (p.4). According to the authors, Chimalapas communities depend on government to resolve land tenure conflicts particularly in regard to seeking legal ownership and legitimacy, an issue that was constantly mentioned in the CHUDEB & CAPLAC (2002) document (See Table 5.2). This finding is also in line with Weber's definition of legitimate domination (by the state) (Weber 1947, 1968).

The government is not directly involved in Chimalapas because of the community's strong lack of trust resulting from a long history of deception and broken promises and the Chimas' strong desire for autonomy (Russell and Lassoie n.d.: 6-7).

There are recent important efforts of governmental agencies to ensure coordination among various agencies, organizations and programs operating in the region. The most recent effort, the Chimalapas Master Plan, initiated formally in January of 2004 by the USAID-funded WWF-CI project, includes the local communities and various government agencies and non-governmental organizations (counting GIEMPBI) as key partners in the process. During the summer of 2004, GIEMPBI was invited to participate in the various meetings that the Master Plan was leading in Oaxaca City as well as in the Santa Maria and San Miguel Chimalapas municipalities, as indicated in written communications directed to GIEMPBI by

SEMARNAT's Oaxacan delegate. The community authorities also demanded the presence of GIEMPBI during the series of *Plan Maestro* meetings.



The retraction of the communities' permission for GIEMPBI to conduct research during summer 2004 (by graduate student researchers) forced a distance on the part of the technical team, but both communities and governmental institutions pointed out the importance of GIEMPBI's research activities and participation within the Master Plan. Once again, GIEMPBI was considered both by institutions and communities as an important liaison in the process of negotiation

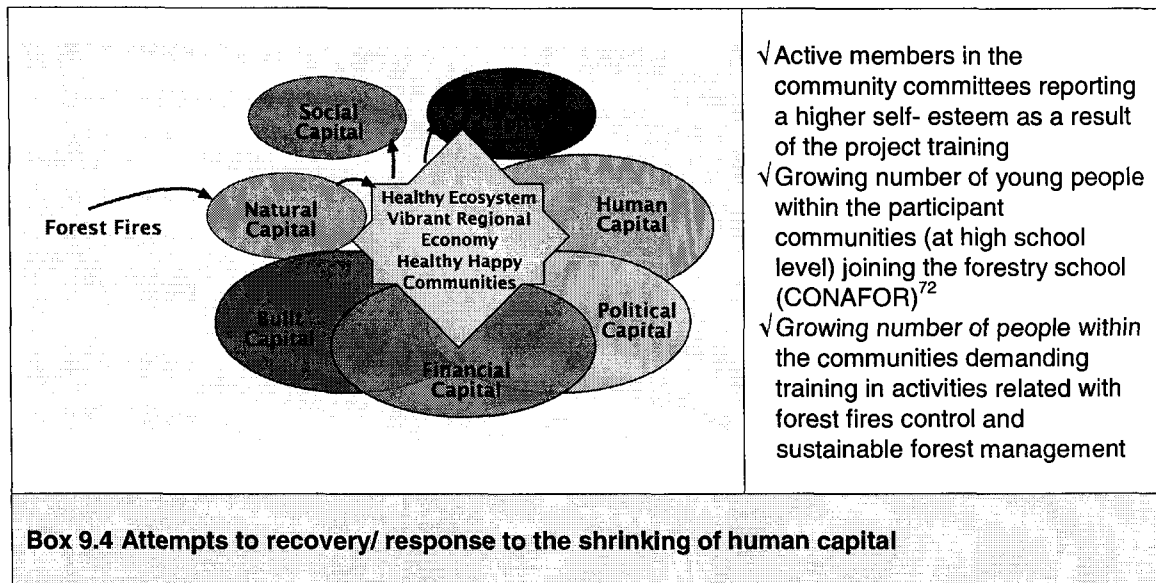
<sup>71</sup> The most recent one, summer 2004, was an effort to force a solution to the problems with *Santo Domingo de Zanatepec* farmers. It involved active participation of men from San Antonio and Benito Juárez, along with representatives of San Miguel de Chimalapa Municipality (Appendix 4).

between institutions (governmental and non governmental) and the communities. As GIEMPBI presence was sought out in the Plan Maestro meetings, during summer 2004, the San Miguel Chimalapas communities tried to use GIEMPBI's influence to garner presidential attention to the agrarian situation. "For this reason we ask you to show solidarity [with San Miguel Chimalapa agrarian conflict] by sending a note to the Presidency of the Republic, urging resolution of the agrarian conflict" "*Por tal motivo les solicitamos que se solidaricen enviando una misiva a la presidencia de la república, para la solución del conflicto agrario*" (From the letter received from the Community authorities after their denial to allow us conduct any research) (Appendix 6)

#### **9.1.4 Responses to a Shrinking Human Capital**

Effects of forest fires on human capital were felt at the community level. Men involved in the fire control brigades started showing fire-related diseases: respiratory, gastrointestinal and dermatological. Beyond the physiological effects, community members engaged in the brigades recognized their lack of training to combat forest fires and to use appropriate equipment which placed them in a disadvantageous situation compared with the official brigades and, even more paramount, at greater risk for harm.

Both Benito Juárez and San Antonio communities demanded the inclusion, within the GIEMPBI community productive projects, of a specific proposal (see Table 7.2) for conservation efforts through forest fire control. This demand resulted in a proposal for an alternative system proposal for the management and control of forest fires (Figure 7.4). Moreover, community members selected to be on the ecological committee (from Benito Juárez and San Antonio) were trained in all aspects of the ecological project, and the senior members of the committee were in charge of training new members. On several occasions, members of these community committees collected ecological information without the presence of the external biologist in charge. They reported in a focus group that this experience "was very important for their self esteem" (Box 9.4).



### 9.1.5 Responses to a Shrinking Cultural Capital

Forest fires attracted the attention of different local, regional, national and international sectors of society, and these groups brought into the Chimalapas region all sorts of outsiders who, while intending to support and help, often tried to impose new ways of life in relation to the communities' natural resource management procedures and knowledge management. At the beginning of the GIEMPBI project, the Chimalapas communities and the technical team sought the inclusion of local knowledge and community participation in all the project activities: planning, design and implementation of the project (Box 9.5).

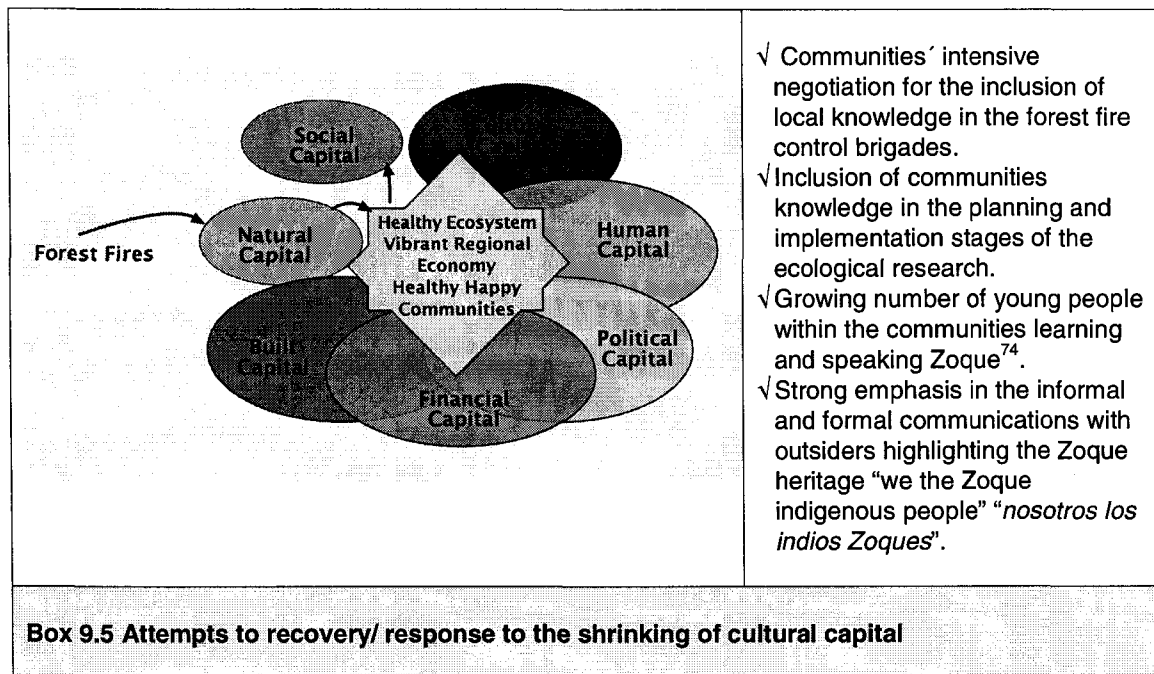
Within the memorandum of understanding, the technical team signed as a commitment with participant communities, "To recognize the value of community members' local knowledge relating to their natural resources and include it as a fundamental part within the project"<sup>73</sup>. Communities' demand for inclusion (political capital) of their local knowledge (cultural capital) and exertion of control over

<sup>72</sup> We had a meeting in the Forestry School (post-secondary vocational school, homologous to a high school) with 5 young men and 1 young woman from Benito Juárez, and there we were informed that 5 youngsters from San Antonio were going to start 2004- 2005 school period (informal meeting with the Forestry School director).

<sup>73</sup> From memorandum of understanding signed by all the participant institutions as well as by communities representatives and authorities (Appendix 4).



external actors was an expression of their resistance (mentioned by Adorno 1991, Gergen 1997 and Habermas 2003) and struggle for autonomy. This resistance was articulated, for example, by insisting on a process of continual renegotiation of the terms of participation with the external technical team and represents an important means by which communities claimed their power over outsiders (political capital).



Another response by the communities related to protecting their cultural heritage was the mounting suspicion of outsiders' role in bioprospection activities. Outsiders conducting ecological research in the communities' forests raises questions and doubts in the communities concerning the outsiders' relation with the communities' natural resources and the implications for the communities' "unknown" but potentially important germplasm. During assemblies and meetings, the communities expressed their concern and their recognition of the importance of

<sup>74</sup> During one of my long residences within Benito Juárez community, I was staying with a family and attempting to learn some Zoque, my instructor was an 11 years old boy (his parents did not speak Zoque, but he is fluent due to the fact that it is taught in the school. Appendix 7)

endogenous germplasm and constantly demanded clarity on the part of the outsiders as to how they would handle it.

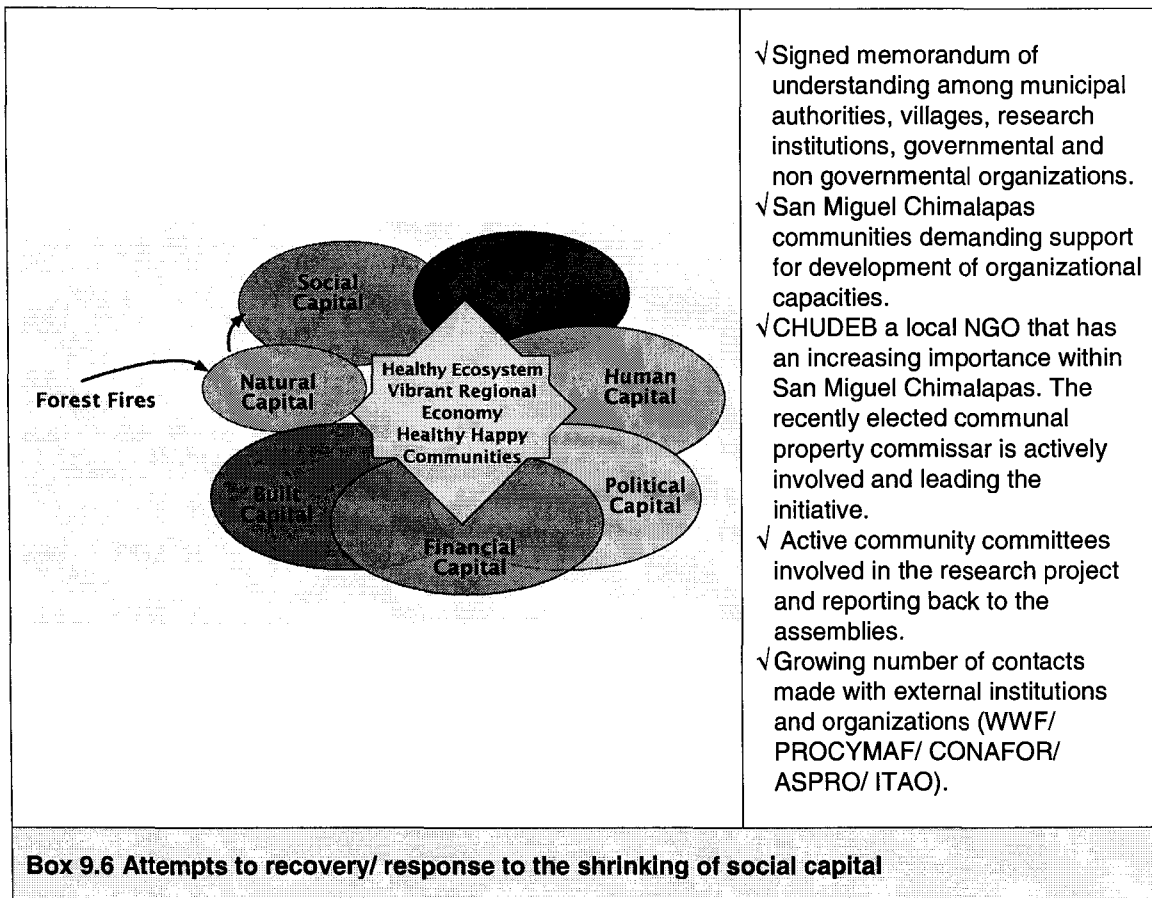
Direct and indirect effects of forest fires over the community germplasm is undeniable. Negative effects on germplasm is directly related with burned areas (affecting wild flora and fauna biodiversity) but also indirectly, considering the fact that if there is out-migration of community members in response to the threats imposed by the fires, the agricultural biodiversity and the importance of crop genetic resources will be affected as well (Bellon et al. 2003).

#### **9.1.6 Responses to a Shrinking Social Capital**

The period immediately following the 1998 forest fire events was characterized by an increased distrust within the communities and toward outsiders (outside institutions and other communities) as everybody was desperately looking for somebody to blame. This situation was a manifestation of past low levels of trust (low bonding and bridging social capital). However, the situation rapidly transformed into an increase in social capital through the communities' openness to outsiders (bridging social capital) and ceasing to blame each other. They actually started working together (bonding social capital) to prevent repeat of a common threatening situation. The increment in social capital was the first response to shrinkage in other capitals, particularly natural and financial as expressed in the destruction of important forest areas and affecting communities' productive activities. The catastrophic nature of the fire events forced the communities toward the recognition of the importance of the development and reinforcement of community organizational capacities (social capital) to face adverse situations, and it also highlighted the relevance of partnerships with different institutions and individuals (social and political capitals) (Box 9.6).

As mentioned above, the first response to the shrinking natural and financial capitals was to increase social capital through a joint enterprise to first control the fire events, and after the fires were extinguished, to start actions to prevent new fire events and promote the recovery of burned areas (see community response to a

shrinking natural capital). The urgent situation forced Chimalapas communities into the recognition of a necessity “to act together” with other members of the same community (bonding social capital), with members of other communities within the Chimalapas region (bridging social capital) and with a wide range of external organizations (governmental and non governmental) (linking social capital).

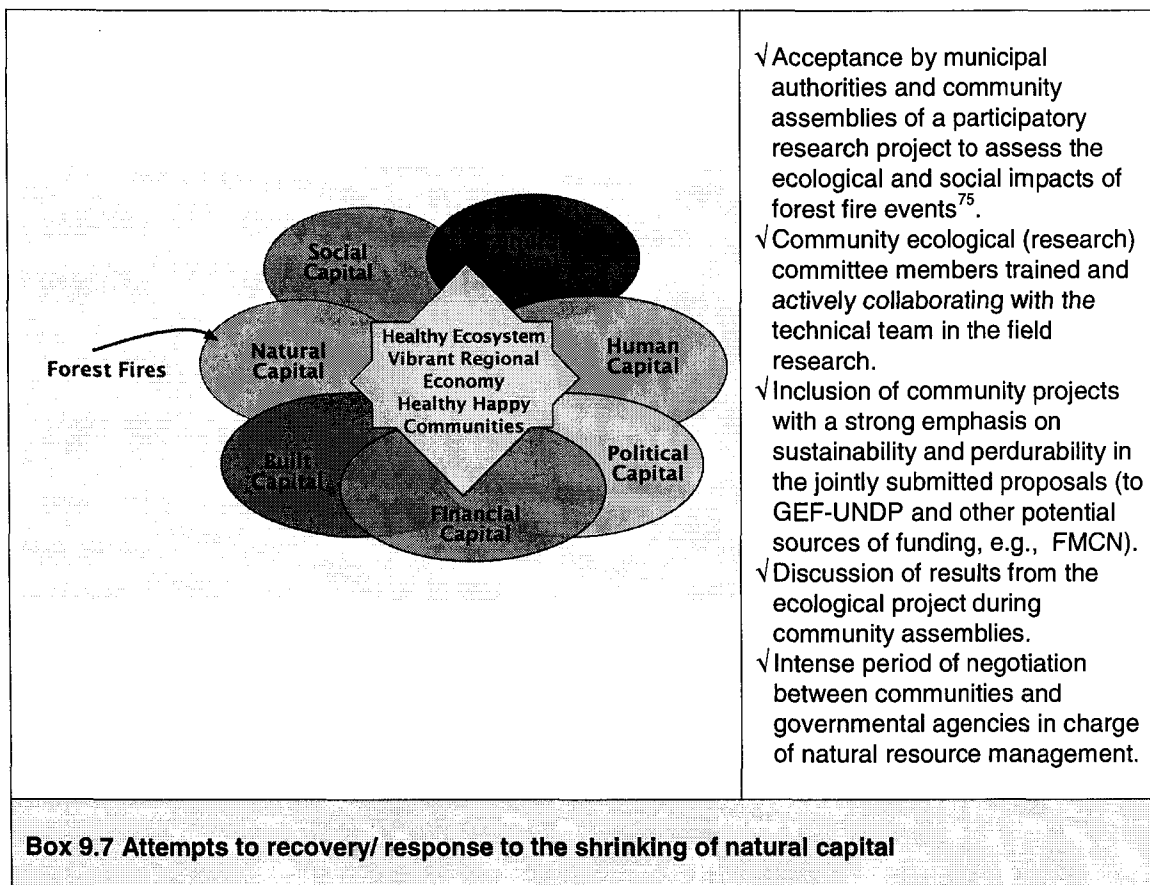


### 9.1.7 Responses to a Shrinking Natural Capital

The effects of the forest fires were felt at the local level. Community members from villages located near burned areas complained about air quality and water quality and quantity. Distant communities in the lowlands (downstream) started complaining about water availability, not only for the agricultural fields, but for household use. The effects of the fires on forest biodiversity were felt especially by

those community members with forest activities (timber and non timber products), an issue that was particularly mentioned by the palm extractors.

After the 1998 forest fires events, the first response from the communities as well as from the diverse institutions was a joint enterprise: communities and institutions started a series of cooperative projects including opening fire breaks (natural capital), establishment of control towers (built capital), cartographical studies (human and natural capital), monitoring of risk spots (natural capital), soil conservation initiatives (natural capital) and reforestation plans (natural capital) (Box 9.7)



The modernization process as it involved from the forest fires was reinforced by a myriad of joint efforts. The post fire events catalyzed a process of

<sup>75</sup> Memorandum of understanding (Appendix 4).

modernization, in which technologically and science-based western models were applied to control and prevent fires and to monitor effects purportedly to modernize community management of their natural resources. Western models were the starting point of the outside response to the effects on the communities' natural capital. These projects were led by external organizations (governmental and non governmental) but required the acceptance and involvement of community authorities and members (reinforcing bridging and bonding social capital).

Community ecological research committees (within GIEMPBI project) as well as other active groups (fire fighters and participants in different projects in relation with community natural capital) were formed by consensus during the community assemblies (political capital). Representatives selected by the communities had the responsibility to bear the assigned task, as well as to inform the assembly of all activities. Some activities had an assigned salary (financial capital), and others were part of the voluntary and obligatory work that members of the Chimalapas communities' are supposed to provide as part of community membership<sup>76</sup> (bonding social capital).

## **9.2 Synergistic Activities within Communities**

Chimalapas communities recognized the relevance of working together (bonding social capital) and seeking outside connections (bridging and linking social capitals) toward the community well-being. Box 9.8 presents two examples that are important to document in order to show how the mobilization of the various capitals within communities enabled them to surpass isolation, marginalization, and poverty. These two cases exemplify how built capital was increased as a result of synergistic activities involving investment of other community capitals. The relevance of such synergistic activities allows the communities to overcome traditional tendencies of patronage, clientelism and chronic dependency on external hand-outs and increases the sense of ownership and pride within communities. Community attempts to

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<sup>76</sup> The obligatory communal work done in Oaxaca and within Chimalapas communities is known as "*Tequio*". In other parts of Oaxaca it includes monetary or goods exchanges and it is called "*Guelaguetza*".

mobilized and invest different community capitals in search of a better future are consider an expression of resiliency.

**Example 1.** In the year 2000, a group of Catholics within Benito Juarez, asked a well respected member of the community (human capital) to help them obtain funds (financial capital) to construct a church (built and social capital). The enterprise of construction of a church within the community was a “big project” that required a lot of money that none in the community could provide (financial capital). In exchange the idea was to negotiate with authorities in San Miguel Chimalapas (political capital) for a modest amount of money (financial capital) to buy a small grain mill (built capital) that in turn would require communal work (social capital) and a small building in which to function (built capital). The money was granted, and with that, the mill started functioning every morning (from 5 am to 8 am), operated voluntarily by members of the community (social capital) to grind corn to prepare *tortillas* (cultural capital). Members of the community are charged a small amount of money for grinding the maize in the mill<sup>77</sup>, and that money is enough to cover the costs of the gasoline to operate the mill, plus a small surplus (financial capital) that regularly is invested in materials for the church construction and to hire a person within the community to supervise a group of volunteers (human and social capital) in the construction. By the time I made my last visit to the community, the construction was well advanced and the mill was still operating as at the beginning of the project.

**Example 2.** When I first entered the communities, there was no transportation service between Benito Juarez and San Antonio and the closest town (El Jicaro), except for occasional private cars that transited the gravel road. Last time that we visited the communities (two years later), Benito Juarez had acquired ‘*la pasajera*’ (an informal communal transportation service). I interviewed people within the community and the story is as follows. The government started an additional stretch of the gravel road beyond Benito Juarez. The construction company had several trucks in good shape, so the community, mobilizing political, social, financial and built capitals, decided to ask the authorities for some funds to buy one of the construction company trucks. The money was granted and now Benito Juarez has twice-a-week service to transport not only people but products between the communities and El Jicaro. This positively affects human capital (access to education and health services), social capital (allowing connections with outside), political capital (due to the fact that authorities responded to the voice of the community helping it acquire the truck), financial capital (opening access to markets), and built capital (the truck is another property within the Benito Juarez community).

**Box 9.8 Examples of synergistic activities within Benito Juarez (based in interviews with key actors of the process)**

<sup>77</sup> Part of the modernization project

From my very first approach to the communities of Benito Juarez and San Antonio as a member of the GIEMPBI project to analyze social impact of the forest fires events, I noticed differences in their organizational capacities, their willingness to work with outsiders and to take the lead in activities conducting to the community well-being (Appendix 3). Despite the fact that here I highlight Benito Juarez' efforts to mobilized and invest a wide realm of the community capitals, it is important to mention that the San Antonio community has been trying to follow the example, but internal divisions and lack of organizations place the community in a disadvantageous position compare with Benito Juarez.

### **9.3 Facing New Risks**

The experience of the Chimalapas communities after the forest fires and the attempts at a simultaneous recovery of the different community capitals has, in my opinion, left these communities and outside institutions better prepared to work together to achieve shared goals of sustainable development. Recognition of the importance of jointly produced knowledge and its role in shaping peoples' future is one of the main legacies of the experience between Chimalapas communities and outside organizations. We see this happening during the negotiation process within the Chimalapas Master plan as well as in different activities jointly conducted between communities and outsiders facing uncertainties that come with constant modernization processes (particularly globalization). The next two sections emphasize the emergent importance of knowledge and its role within externally driven processes that affect rural communities and that determine whether or not it is possible to achieve sustainable development and maintain the relationship between a healthy community and a healthy ecosystem.

#### **9.3.1 Knowledge as Power, Knowledge as a Risk, Knowledge as a Tool**

Weber (1968) argues, "The primary source of the superiority of bureaucratic administration lies in the role of technical knowledge which, through the

development of modern technology and business methods in the production of goods, has become completely indispensable” (p. 223).

The GIEMPBI project within the Chimalapas communities intended, beginning in the planning stages, to create a truly cooperative and participatory research project. Production/generation of new knowledge was key within the technical team, understanding that the leading institutions were research institutions (ISU, SLU, IDS SU), but the participatory core of the project recognized the importance of local knowledge (Bhattacharyya 2004), including joint generation and community appropriation of that “new” knowledge. The model of joint generation and community appropriation of knowledge was an attempt on GIEMPBI’s side to surpass the prevalent extractive research model. In this context, the participatory research (with limited participation and exchange of information) appears to be just one modern expression of extractive development research models (Chambers 1994). It is important to recognize that there was no local knowledge of the sites of the ecological study (beyond the topographical indications), and discoveries were made by community members and researchers together.

GIEMPBI, organizations, agencies, municipal authorities and the two communities signed a Memorandum of Understanding with the goal that the resulting knowledge was going to have a positive impact on natural capital (e.g., better understanding of the forest fire effects, reducing of risk of new fire events, etc.), but also it acknowledges their commitment in a joint enterprise in which this jointly co-generated knowledge affects the rest of the community capitals (human, social, cultural, political, financial and built). It was clearly expressed in the obligations assumed by the signatories/stakeholders and in the guiding philosophy of the group.<sup>78</sup> Talking about social perception of deforestation in Chiapas, Arizpe et al. (1996) argue, “Our assumption in this study is that, when a problem arises, it generates a social process of perception, creation of knowledge, and understanding that is built on the social exchange of information and on the alliances and conflicts with other individuals and social groups” (p. 5).

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<sup>78</sup> From the memorandum of understanding (Appendix 4)



Key informants belonging to the Chimalapas GIEMPBI team categorically affirm that the project “*was not a rural development project*”, disregarding the fact that from the planning stages the project evolved into a “community natural resource management project” which essentially had important elements of a rural development project (Figure 7.5). Escobar (1995) argues that development ideas include wide and vigorous applications of modern scientific and technical knowledge (supposed to be produced by the project) in addition to greater production (that forced in a way the inclusion of the community productive projects), as keys to prosperity and peace. Escobar (1995) sees development projects leading to higher levels of industrialization and urbanization, mechanization of agriculture (including the irrigation projects that Chimalapas communities were demanded), adoption of modern education (young people from the communities joining the forest school and other high education institutions-including ITAO) and adoption of cultural values (the imposition of written bylaws as a condition *sine qua non* to the establishment and recognition of the communal reserve area), and growth in the material production and living standards (communities’ productive projects as an alternative source of income, sustainable livelihoods).

Within the GIEMPBI project knowledge encompassed all the categories theorized in chapter two. Knowledge was a source of power and differentiation affecting communities’ human, social, political and cultural capital. Knowledge was also a potential risk, especially in relation to the social, cultural and political capitals. Moreover, knowledge was understood, among both communities and outsiders, as a tool for improving living standards in relation with social, human, natural, financial and built capital.

### **9.3.2 Externally Driven Globalization Processes**

The chain of events in 1998 that placed the Chimalapas communities in an unusual and threatening situation for which they were not prepared had a connection with an externally driven globalization process: global warming. Documents, as well as interviews and conversations with people in the Chimalapas region mentioned

that 1998 was characterized by a severely dry season combined with a more extreme El Niño phenomenon.

Weather conditions (potentially having origins in global warming) were combined with agrarian conflicts, which were a component of the human induced forest fires (Anta 2001, Anta and Plancarte 2001, Asbjornsen et al. 2005). The agrarian conflicts in the Chimalapas have a strong connection with governmental relocations of people by establishing new *ejidos* on communal lands (as part of the externally driven modernization process). Thus the Zoques responded to the government sponsored relocations by attempting themselves to occupy those spaces communally (the so-called second phase of colonization). This competition for land brought into the region people with different approaches to the management of the natural resources (basically slash and burned agriculture and extensive grazing), which exacerbated the already delicate and complex situation.

Nonetheless, globalization seems to have had a two-fold impact, bringing not only risk and thus threatening the communities (the effects of global warming and the presence of external institutions and outsiders with new rules, ideas and *cosmovisión*), but also bringing opportunities and possibilities that must be taken into account. Giddens (1990:12) in his call for a reflexive modernization, claims that modernity is “multidimensional on the level of institutions” with an extreme dynamism and globalizing scope continually ordering and reordering social relations. One important contribution of modernity and globalization as a characteristic of modernity is the fact that “globalization is the reason for the revival of local cultural identities in different parts of the world” (Giddens 2000: 31). Fukuyama (2001) points out that globalization could be “The second source of social capital in developing countries” (p.19) (the first one being religion). He argues that globalization “has been the bearer not just of capital but of ideas and culture as well” (p.19), and ends the paper asking whether globalization “breaks down traditional cultural communities without leaving anything positive in its wake” (threatening and injuring indigenous cultures and traditions), or rather, “is an external shock that breaks apart dysfunctional

traditional and social groups and becomes the entering wedge for modernity” (bringing new ideas, habits and practices) (p.19).

The Chimalapas communities are no longer as isolated and marginalized as in the recent past. They have been the target of a myriad of development projects and programs, and subsequently have been facing new risks and challenges that will bring intended (and more often than not unintended) outcomes and consequences for which they must be prepared. Whether governmental or non-governmental projects, interventions and development programs, or the effects of new forms of ‘progress and development’ (including Plan Puebla Panama, NAFTA, etc.), they are going to continue facing a decrease in their forest areas, a fact in the “risk society” (Beck 1999, Giddens 2000), at the same time that there is a higher demand for their environmental services and external pressures over the control and preservation of their natural resources.

Past experiences with outsiders have an impact on the communities. Hopefully their experience with GIEMPBI project will have some positive impacts, which will be expressed in a more transparent work with outsiders, opening opportunities to express resiliency (communities better prepare to achieve sustainable development) and to respond to common threats.

## CHAPTER 10. CONCLUSIONS

The changes that occurred with the overall research project that forced the modified analysis provides a unique opportunity to critically assess the “rise and fall” of a participatory research project (or an unintended development project which I consider an innovative approach) and the complexities of a broad range of internal and external community relations influencing these processes. The Community Capitals Framework (CCF) provides an effective means of analyzing the impact of ecological disturbances on the community as a dynamic system and to understand, first, the positive impact of investing in the different capitals to create positive change and second, the relevance of dialogue and reflection for enabling the recovery and transformation of the community capitals (a “spiral up” community).

This qualitative analysis of the changes in the Chimalapas communities after the 1998 forest fire events provides evidence of some main notions that I consider important to highlight:

- 1- “The Domino Effect”: a severe ecological disturbance (fire) can affect not only the natural capital of a rural community, but also the rest of the community capitals (social, human, cultural, political, financial and built).
- 2- The high visibility and catastrophic nature of this ecological disturbance triggered the attention of different levels and sectors of society (local, regional, national and international), something that in most cases does not happen (comparing with more chronic but less noticeable processes of deforestation due to diverse and complex causes as expansion of the agricultural frontier, illegal exploitation and depletion of vast forest areas, and aggressive and invasive development programs among others) creating new opportunities and openings for dialogue between communities and external actors experiencing a common threat to act upon.
- 3- The reaction of the state and its agencies was symptomatic and unisectoral (attending just the recovery of natural capital). This response was not only inefficient but worsened the shrinking of the social capital, leading to the disruption

of communication between the communities and external institutions and leaving behind a growing resentment and distrust, causing the community to spiral down.

4- The Chimalapas post-forest fires circumstances presented a different situation. A project to jointly analyze the ecological and social effects of the forest fire events surpassed the symptomatic and unisectoral approach, and through dialogue and reflection revealed preexisting problems and encouraged holistic action initiating and allowing a process of simultaneous recovery and transformation of the community capitals (a “spiraling up” community).

5- The extremely complex situation in which the Chimalapas communities must live (ecological and social), accompanied by past experiences with paternalistic and clientelist modernization approaches and the ever-present agrarian conflict, worsened by partisan political struggle and violence preceding gubernatorial elections (affecting social and political capitals) along with the impossibility of GIEMPBI’s on fulfilling the communities’ expectations (in terms of financial and built capitals) led to the final breakdown of the relationship between the communities and what I called ‘the innovative approach’.

6- There are important lessons to be gained from this effort to achieve a community participatory research and development. In particular I cite those highlighting how the process of modernization triggered by the fires was accompanied by all the risks that this modernization process implies for the communities (on the human, political and cultural capitals), moving the community either in an upward spiral or a downward spiral

As a whole, I believe that there is not enough evidence from this research to conclude that there is a strong relationship between a healthy community and the recovery of a healthy ecosystem, but one can say that there is a strong positive influence of the configuration and synergy between the community capitals (what I consider in my theoretical framework a ‘healthy community’) on the process of co-management of communal resources towards a healthy ecosystem.

The situation faced by the Chimalapas communities in the post forest fires period is the result of a long history of modernization processes, accompanied by

unique opportunities for transformation and innovation to face these processes. An extreme El Niño drought year likely linked to global warming (a reality in the risk society resulting from reflexively applied knowledge and subsequent technological advances), triggered unique and severe fires in the Chimalapas forests and exacerbated the imbalance among the community capitals. This process was driven by changes in socio-environmental relations and pushed the communities towards acceptance of outsiders that brought new paradigms and lifestyles (including the acceptance of the importance of scientific knowledge in relation to communal resources and the acceptance of written by-laws among others).

Local communities faced increased pressures from external interests (i.e., a protected area establishment, biopiracy, globalization) evidencing the weakness of weak ties (Levitte 2004) which threatens local control over their natural resources and eroding communities' human, natural, cultural and political capitals. I assessed the changes of the community capitals as part of the evolution of a more integrated collaboration between external researchers and local partners (as part of the modernization processes). The 'development' processes that accompany the introduction of outsiders provided an opportunity for the communities to negotiate control, to 'encounter development' (Escobar 1995) and to reinforce their own social structures in order to face any new situation in this undeniably risk-oriented society (Giddens 2000). This process provided a critical basis for empowering local communities to negotiate the management of their natural resources and fire prevention programs and to change the established relationship dynamics within the communities and with outsiders. The spiral up shows how communities were able to respond to the challenge, changing the configuration of the community capitals as a whole.

A project which began as research on the ecological effects of forest fire events evolved into an attempt to take a holistic approach to sustainable natural resource management, including aspects of rural development. The project evolved to be presented as an innovative and appropriate approach to the sustainable management of the communities' natural capital. While this innovative project was

partially successful in gathering ecological data, it failed to fulfill the rural development expectations of the communities. This situation, along with preexisting issues (agrarian conflict, paternalistic and clientelistic approaches and political uncertainty, including externally imposed partisan politics) and internal difficulties (power struggles, incipient organizational capacity), produced a breakdown of the process. Nonetheless evidence of the positive impact on the communities (prevalence of the spiral-up) after the experience with the GIEMPBI project is reflected in the Chimalapas Master Plan. This initiative is based on dialogue and reflection and includes the main stakeholders of the GIEMPBI project. Hopefully this will be the next step in achieving the necessary conditions to keep the Chimalapas communities on an upward spiral that might help reach the final goal of healthy communities and healthy ecosystems.

The persistence of development projects focused either on unisectoral and narrow responses or just on economic approaches and the readiness of the communities to accept (and what is worse, demand) handouts and other paternalistic relations with outsiders makes an alternative approach very difficult. Co-management, co-responsibilities and joint enterprises focused on the construction of advocacy coalitions around specific issues affecting community health, sustainable development and the environmental sustainability, are examples of those alternative approaches. However, without an appropriate level of receptivity within targeted participating communities, the success of such approaches is uncertain.

There are a series of conditions *sine qua non* for accomplishing the goals of empowerment and appropriation of a truly sustainable development project. Some of those are extremely idealistic and need a 'vacuum' and pristine situation that rural communities in Latin America do not have, considering that they have been facing a wide range of "development" approaches since the arrival of the Spaniards in the 15<sup>th</sup> century. Nonetheless the fact that any approach must be flexible and ready to adapt to the particular political, social and economical situation is key in the process. There are no magical formulas or 'recommended' levels of participation to succeed in development efforts beyond the premise of 'be prepared to adapt and change'.

Modernization projects approach rural communities interested either in some of the resources present within communities or in 'helping the communities' in their search for the moving target of sustainability. Acknowledging that there is no such a thing as "communities ready" to change or "researchers with all the answers" is a first step in the construction of processes of mutual discovery of a better shared future having as premises receptivity, compromise and humbleness (on both sides).

Typical top-down development projects, those that reify technological/scientific knowledge over the sociological realities of isolated and marginalized rural communities, are another example of the inappropriate attempts to overcome the enforcement of modernization of societies in general. Serious and mindful attempts to increase local well-being and sustainable community development can help in understanding how to surpass the modernization project. In these cases projects and programs identify and build on local community assets, they do not demand capital-intensive investments, but may change social institutions to use existing resources more effectively.



## CHAPTER 11. RECOMMENDATIONS FOR FUTURE RESEARCH

Gender issues, a follow-up to the recovery of the burned areas (as an expression of a healthy ecosystem), the new Chimalapas Master Plan and the processes of migration, are areas that I consider outside of the scope of this study, but closely related and thus important for future research.

Due to its relationship to social capital and sustainability, gender is an important factor that should be addressed in the very patriarchal communal land system in the Chimalapas in order to understand some of the social dynamics around natural resources management in relation to sustainable livelihoods. In her article "Gender, livestock assets, resource management, and food security: lessons from the SR-CRSP", Valdivia (2001:27) highlights the relationship between gender and resource management. "The research experiences show the relationship between gender, resource management, and the ability to build livestock assets and security, in different household production systems". Flora (1998) argues that social capital "places emphasis on the will and the capacity of people to solve problems and improve their lives in a joint enterprise" (p.503). In Flora's (2001:45) words "social capital for sustainability depends on strengthening communities of interest and communities of place. Social capital in both these types of communities is often gender-based and has implications for natural capital". What Flora and Valdivia suggest could apply to the Chimalapas region and communities, where the inclusion of women is essential in the whole process of construction of social capital toward a sustainable use of the natural resources.

As an important conclusion of this research, I argue that there is not enough evidence to conclude that there is a strong relationship between a healthy community and the recovery of a healthy ecosystem. There is evidence of fewer incidents of human induced forest fires (using GIS and other reports from CONAFOR), but to analyze the actual recovery of the affected areas, it is necessary to have data of recovery over time and space. My perception is that it will be easier to get information reporting that the damage to the environment has stopped, but

there are no reports of a reversal and recovery from such damage due to communities' intervention through effective management practices reinforced and supported with conservation policies.

Although significant advances have been made within the Chimalapas Master Plan (built on a more collaborative effort among stakeholders), the GIEMPBI experience with the Chimalapas communities suggests that there is a need for a more concerted effort to bring together all the different stakeholders to build greater consensus and political support at both the local and state levels for integrating truly sustainable community development and management of protected areas.

One impact of modernization and globalization on the communities' human capital in rural areas in Mexico is the out-migration. Community members, mostly men, facing the impossibility of providing adequate support for their families, consider out-migration as an option. On the one hand, if they move out, and later move their family with them either to other region in Mexico or the US (considering that Oaxaca is the second sending state of immigrants) that family is not going to maintain the beans, corn and squash germplasm (among others) that they historically have managed. That may mean a loss of that germplasm. On the other hand, if men move out planning to come back, they start sending money to the remaining family. The common use of those remittances, along with supporting the family, is to buy livestock, which will in turn have an effect on the environment, because it will require slash and burn practices for the establishment of pastures<sup>79</sup>. An in depth study on out migration would be highly recommended to analyze the impact of this trend on the rural communities and their surrounding environment.

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<sup>79</sup> This is happening to a degree in Benito Juarez, but mainly in San Antonio.

**APPENDIX 1. INTERVIEW PROTOCOL**

**Healthy Communities= Healthy Ecosystems: Evolution of a participatory research project towards a community natural research management process.  
San Miguel Chimalapa, Oaxaca, Mexico**

**I. Conceptual Framework**

Vision, mission, goals and objectives of the participatory project

Why the project?

Kind of project

Approach, Why?

Strengths

Weaknesses

Strategies

Context

Local

Regional

National

**II. Tactics**

Main stakeholders characteristics/ Nature of the project

Who participated in the project? (Probe: Beneficiaries/facilitators/ technicians/ researchers)

Stakeholders Role?

How was the group structure defined?

Relationship among different stakeholders? (Probe: Institutional/technicians/ researchers/ communities)

Nature of the project (Probe: Objectives/Outcomes/ Activities/ Indicators)

**III. Implementation**

Implementation/ Outcomes/ Impact/ Lessons Learned

What has been done?

What hasn't?

Changes in the stakeholders' agenda?

Changes in the research topic?

Changes in practice?

How adequate was initial idea?

How we measure outcomes and impact?

Who has benefited from the project? Why? (Why not?)

Main lessons learned? (What is relevant to share with others about the process?)

Main difficulties and obstacles? (How to surpass them?)

**APPENDIX 2. FOCUS GROUP PROTOCOL**

**Participatory Evaluation of Ecological Research- Los Chimalapas,  
Oaxaca, Mexico**

**Matrix to motivate Focus Groups**

		What we know	What we learned	Coincidence	Results from combination
<b>Fire Management</b>	<b>Effects on the forest</b>				
	<b>Effects on the community</b>				
<b>Methods</b>					
<b>Plant Species</b>					
<b>Plant Uses</b>					



<b>Benefits from this information</b>	
<b>To the Forest</b>	
<b>To the Community</b>	



<b>And the Future?</b>	
<b>To the Forest</b>	
<b>To the Community</b>	

**APPENDIX 3. SUMMARY OF FIRST PERCEPTIONS: OBSERVATIONS/  
INTERPRETATION (MAY 2002).**



	Origins	Presentation	Comments	Comm.Org	Infrastructure	Organizatio n in general
<b>Benito Juarez</b>	1972. A group of Zoque people claimed their rights over the land	Presentation to the assembly: 6/2/2002. The president assigned to me 15 minutes but we discuss the project during two hours. Lots of questions and the assembly agreement to sign a document of intention to get the commitment of both: whole community and the researcher.	One of my commitments is to share every single document that I write about the community or its process. Also, there is a commitment on my side to visit the community twice a year in order to build trust, share experiences and start the process of a participatory research. I noticed that in the assembly in Benito Juarez there are no women present.	Benito Juarez community seems to be a well-organized community. They recognized the importance of community organization and service. There is an NGO: CHUDEB that started inside the community in order to prepare projects and have access to external sources of fund.	This community seems to be a well-organized one: the distribution of houses, community buildings (school, communal house, church, etc.) and roads is clear and follows a logical order. Many of the communal buildings (including some of the school classrooms) are product of the collective action. They are in the process of construct a Catholic church with communal funds and support.	There is the presence of committees in charge of different functions that serve as a support to the communal authority: school issues, church construction, school meals, etc. An important feature to highlight is the presence of an NGO started in Benito Juarez: CHUDEB mentioned before.

**APPENDIX 3. Continued**

<b>San Antonio</b>	1984. Basically people from Benito Juarez (Zoque ethnical group)	Presentation to the assembly: 5/30/2002. The president assigned to me 15 minutes and we discuss my project with them for 35 minutes. I didn't notice the levels of receptivity and interest that I noticed inside Benito Juarez assembly.	I made with this community the same commitments that in Benito Juarez (to share all the information and stay with them twice a year). There are women active in the assembly, because they are widows or because they are replacing an absent husband.	My first impression is that this community is not as well organized as Benito Juarez. There are small groups that express lack of trust. They refused to participate in the new NGO activities.	Infrastructure in San Antonio does not look as well organized and developed as in Benito Juarez. Maybe this could be due to the fact that it is a younger community and moreover, to the fact that the community is literally cross through by the rural road.	A fact to highlight is the presence of a women organization that is attempting to get external money to fund a wildlife management project. They have the support of the communal authorities.
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**APPENDIX 4. MEMORANDUM OF UNDERSTANDING**

**ACUERDO PARA LA  
LA PLANEACION Y COLABORACIÓN  
SOBRE EL PROYECTO:**

**Evaluación de los Impactos Ecológicos  
de los Incendios de 1998 y Desarrollo  
de Proyectos Comunitarios Piloto  
en San Miguel Chimalapa, Oaxaca**

**QUE ESTABLECEN Y ACUERDAN:**

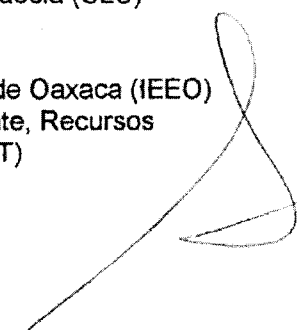
Las Comunidades:

- El Municipio de San Miguel Chimalapa
- Las congregaciones participantes: Los Limones, Benito Juárez, San Antonio, y Las Conchas

El Equipo Técnico:

- El Instituto Tecnológico Agropecuario de Oaxaca (ITAO)
- El Departamento Forestal de la Universidad de Iowa - USA (ISU)
- El Instituto de Estudios de Desarrollo de la Universidad de Sussex - GB (IDS)
- El Departamento de Ecología Forestal de la Universidad de Agricultura de Suecia (SLU)

Enlace Institucional:

- El Instituto Estatal de Ecología de Oaxaca (IEEO)
  - La Secretaría del Medio Ambiente, Recursos Naturales - Oaxaca (SEMARNAT)
  - WWF-Programa Oaxaca
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## INTRODUCCIÓN Y ANTECEDENTES

Los incendios de 1998, afectaron grandes extensiones de bosque en México como en el mundo en general, provocando una serie de discusiones sobre las implicaciones ecológicas y sociales que podrían tener estos eventos catastróficos. En la región de Los Chimalapas en Oaxaca, México, una de las áreas con más alta biodiversidad y con mayor extensión de bosques húmedos en el país, fue afectada aproximadamente en una tercera parte de sus bosques por estos incendios. Una gran parte de estas áreas quemadas corresponden a bosques primarios de selva mediana y selva alta, bosque mesófilo y bosque enano. Históricamente el bosque mesófilo y el bosque enano no habían presentado incendios en esta región. Ésta inusual ocurrencia de incendios en éstos bosques como las grandes extensiones afectadas, se han relacionado con los efectos de sequía extrema ocasionados durante el fenómeno de "El Niño" en 1998. Como resultado, ha aumentado la preocupación a nivel local, nacional e internacional sobre las consecuencias ecológicas de los incendios en Los Chimalapas y las implicaciones de éstas sobre la calidad y las estrategias de vida de los pobladores en la región.

Los incendios forestales pueden tener efectos directos e indirectos que se reflejan a diferentes niveles: local, regional y global. Dentro del primer nivel podemos hablar de la pérdida y modificación local de las especies, la erosión y el empobrecimiento de los suelos, cambios en el microclima y modificaciones en la productividad del sitio. Regionalmente, se pueden modificar los flujos y el abastecimiento del agua, se pueden generar fenómenos drásticos y recurrentes como inundaciones o periodos de sequía extrema que afecten el meso-clima de la región y provoquen cambios en los bosques de tierras bajas, áreas de cultivo y pastoreo, así como en los asentamientos humanos. A nivel global existen registros de que los incendios suelen tener implicaciones importantes en las tasas de fijación del carbono y en los cambios globales de clima que están ocurriendo.

A nivel mundial existe muy poca información sobre los efectos de los incendios en los bosques húmedos y sobre la capacidad que tienen para recuperarse. Sin embargo, hay algunos estudios que han señalado que en el bosque mesófilo los procesos de recuperación después de una perturbación (por ejemplo, un huracán) son más lentos, en parte, por las condiciones climáticas extremas en las que se desarrollan y por la complejidad que posee este ecosistema. Hasta el momento, no existen estudios que describan los efectos de los fuegos sobre estos bosques mesófilos, por lo que se desconoce también cual será su capacidad para recuperarse después de ellos y cuáles serán los cambios ecológicos. Además, existe una falta de información sobre los conocimientos que la gente local posee sobre la historia y el manejo de incendios en la región, lo cual también es un elemento importante de considerar para entender la dinámica de los incendios en los bosques y el contexto socio-político en el que ocurren. A pesar de estas observaciones, los avances son pocos y lentos sobre la evaluación de las áreas quemadas en Los Chimalapas.

En este momento los pobladores de Los Chimalapas enfrentan la problemática de cómo manejar grandes áreas quemadas de bosques húmedos y de cómo aplicar una metodología que les permita obtener una recuperación adecuada de éstos en el futuro. Para lograr la

planeación e implementación de tal plan de manejo, es esencial tener información sobre los cambios ecológicos y el proceso de recuperación de las áreas quemadas. Además, consideramos que el identificar y probar alternativas de manejo de los recursos forestales, puede reducir las presiones sobre los bosques naturales y ayudar de manera importante a su recuperación.

El proyecto que estamos planteando busca generar la información, los datos y las experiencias que puedan ayudar al desarrollo de estrategias comunitarias de manejo y conservación de los recursos de la región. La implementación de proyectos productivos en algunas comunidades-piloto y los experimentos de campo podrán ser incorporados en planes de manejo desarrollados por las comunidades en el futuro. De esta manera, se intenta responder a prioridades locales integrando la investigación científica a la realización de algunos proyectos productivos comunitarios.

### OBJETIVOS GENERALES Y ESPECÍFICOS

#### 1. Evaluar y analizar los efectos ecológicos de los incendios ocurridos en el año de 1998, sobre algunos de los bosques tropicales de San Miguel Chimalapa, Oaxaca.

##### *Objetivos Específicos:*

- a.) Diagnosticar el estado actual de los bosques dañados por estos incendios.
- b.) Analizar los cambios de vegetación, suelo, microclima y biodiversidad causados por los incendios, y los impactos de estos cambios sobre los procesos ecológicos (estados sucesionales, ciclo de nutrientes, productividad ecológica).
- c.) Estimar la potencialidad y tiempo de recuperación de los bosques afectados.
- d.) Con base en la información generada hacer recomendaciones sobre el manejo y la recuperación de áreas incendiadas.
- e.) Analizar las interacciones entre las áreas quemadas y las áreas aledañas del paisaje.

#### 2. Analizar el contexto histórico del control y manejo de los incendios desde una perspectiva comunitaria e institucional, evaluando las contribuciones de los conocimientos locales y técnicos en la formulación de estrategias para el manejo de los recursos naturales.

##### *Objetivos Específicos:*

- a.) Analizar la historia de los conocimientos y las experiencias del manejo del fuego entre los pobladores, y las percepciones sobre los incendios y los impactos que han tenido sobre el medio ambiente.
- b.) Revisar las políticas públicas sobre el manejo de los recursos forestales y la prevención, manejo de incendios y su incidencia sobre el monitoreo y prevención de los incendios en la región.

*Acuerdo para la Planeación y Colaboración sobre el proyecto: Evaluación de los Impactos Ecológicos de los Incendios de 1998 y Desarrollo de Proyectos Comunitario Piloto en San Miguel Chimalapa, Oaxaca, 4 de noviembre, 2000.*

- c.) Evaluar la respuesta comunitaria (resistencia y resiliencia) a los cambios causados por los incendios (por ejemplo, cambios en percepciones, actitudes, manejo de los recursos naturales, etc.).

**3. Colaborar en la planeación e implementación de algunos proyectos comunitarios de tipo productivo y de conservación que mejoren la calidad de vida en las comunidades y que favorezcan el mantenimiento del bosque.**

*Objetivos Específicos:*

- a.) Diagnosticar con los comuneros el estado actual de los recursos naturales y su aprovechamiento, así como las necesidades locales.  
b.) Seleccionar comunidades para desarrollar proyectos piloto con base a un proceso de evaluación y discusión participativa con el municipio y las comunidades y definir un proyecto productivo en cada comunidad piloto.  
c.) Apoyar en la capacitación técnica y organizativa a los comuneros para la realización de proyectos productivos y para diversificar el uso de sus recursos naturales.  
d.) Asesorar en la formulación de propuestas comunitarias para la gestión de recursos y para el manejo adecuado de los mismos por los comuneros.

**4. Usar una metodología participativa entre el trabajo técnico y comunitario, lo cual permitirá un intercambio continuo de ideas, conocimientos, y experiencias.**

*Objetivos Específicos:*

- a) Propiciar la colaboración entre investigadores y pobladores en la planeación e implementación de los estudios, en el análisis y en la presentación de los resultados.  
b) Hacer talleres participativos en las comunidades para el intercambio de información y conocimientos y el análisis conjunto de su relevancia en el contexto local durante todo el proceso del proyecto.  
c) Promover la capacitación y formación de los pobladores a través de cursos y talleres locales, tanto como la participación de ellos en programas académicos de las instituciones participantes.

**5. Promover la colaboración académica y el intercambio de investigadores y estudiantes de las instituciones y comunidades participantes.**

*Objetivos Específicos:*

- a.) Realizar los trámites inter-institucionales para convenios de colaboración y desarrollar propuestas conjuntas.  
b.) Promover un enfoque interdisciplinario en la investigación y docencia, a base de equipos integrados por investigadores, pobladores y estudiantes.  
c.) Promover la participación de estudiantes e investigadores mexicanos y extranjeros en el desarrollo de los proyectos y en estancias académicas.

- d.) Promover talleres, seminarios, y cursos en las instituciones académicas y de carácter local, y solicitar becas para los jóvenes de la región con las cuales se apoyará su participación en programas de educación.
- e.) Contribuir al desarrollo de los programas de estudio en los distintos niveles (licenciatura, maestría, doctorado) de las instituciones participantes.

#### **DESARROLLO Y AVANCES EN LA PLANEACIÓN (ENERO – SEPT. 2000)**

##### **Enero – Febrero**

- Reuniones y talleres de planeación con las instituciones y comunidades
- Recorrido de algunos bosques quemados (Zona Oriente)
- Memoria de la planeación inicial

##### **Marzo – Abril**

- Compilación y revisión de información sobre Los Chimalapas
- Borrador de los Convenios de Colaboración

##### **Junio – Julio**

- Taller en San Miguel Chimalapa
- Recorridos en las comunidades (áreas quemadas y manantiales)
- Presentaciones en las asambleas comunitarias
- Memoria del taller e informe de los recorridos

##### **Agosto - Septiembre**

- Presentación de la propuesta al nuevo Comisariado de San Miguel Chimalapas
- Reuniones con las comunidades piloto
- Presentaciones en asambleas comunitarias

#### **SEGUIMIENTO DE LA PLANEACIÓN (ENERO – AGOSTO 2001)**

##### **Enero – Marzo**

- Terminar el proceso de planeación con las comunidades participantes de San Miguel Chimalapa definiendo y desarrollando una propuesta de proyecto comunitario piloto con la participación de los representantes de cada comunidad.
- Elaborar la propuesta para un proyecto a mediano plazo (3-5 años), y presentar la propuesta al municipio y las comunidades, y a las posibles fundaciones
- Protocolización de un Acuerdo de Colaboración para la planeación y colaboración sobre el proyecto entre las instituciones y comunidades participantes.
- Protocolización de un Acuerdo de Colaboración entre las instituciones académicas sobre educación e investigación.

Acuerdo para la Planeación y Colaboración sobre el proyecto: Evaluación de los Impactos Ecológicos de los Incendios de 1998 y Desarrollo de Proyectos Comunitario Piloto en San Miguel Chimalapa, Oaxaca; 4 de noviembre, 2000.



**Marzo – Agosto**

- Realizar las actividades de capacitación técnica y organizativa en las comunidades para iniciar el establecimiento y desarrollo de los proyectos piloto.
- Iniciar el trabajo de campo para la evaluación de los sitios quemados, la selección de los sitios de estudio, el establecimiento de parcelas permanentes y la colecta de datos.

**COMPROMISOS PARA LOS PROYECTOS COMUNITARIOS**

Durante el taller de planeación de proyectos comunitarios piloto del municipio de San Miguel Chimalapa, realizado en Juchitán, Oaxaca del 19 al 23 de enero, 2001, se analizó la problemática de cada comunidad participante, sus causas y alternativas de solución. De estas alternativas se priorizó los siguientes proyectos para cada comunidad:

<u>Comunidad</u>	<u>Título del proyecto</u>
San Antonio	"Organización de agricultura sana en San Antonio, municipio de San Miguel Chimalapa."
Benito Juárez	"Conservación ambiental mediante prevención y control de incendios forestales en Benito Juárez, municipio San Miguel Chimalapa."
Los Limones	"Establecimiento de huertos familiares y hortalizas en Los Limones, municipio San Miguel Chimalapa."
Las Conchas	"Reforestación de manantiales con árboles frutales y nativos de la comunidad de Las Conchas, San Miguel Chimalapa."

**FILOSOFÍA GUÍA DEL EQUIPO TÉCNICO**

*El Equipo Técnico se compromete a:*

1. Respetar a las autoridades municipales y comunales de la región, sus formas de organización y normatividad.
2. Respetar los acuerdos comunitarios y de las instituciones participantes.
3. Reconocer el valor del conocimiento empírico de los pobladores acerca de sus recursos naturales e incorporarlo como parte fundamental de este proyecto.
4. Involucrar la participación de las comunidades en toda la planeación, el establecimiento, y el desarrollo del proyecto.

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5. Solicitar los permisos correspondientes para la realización de sus actividades científicas (por ejemplo, colecta de material botánico, muestreos, y toma de datos).
6. Contribuir a la solución de algunos problemas específicos planteados por las comunidades dentro de las posibilidades del equipo técnico.
7. Presentar y discutir los avances obtenidos con las comunidades durante las distintas fases del proyecto.
8. No hacer declaraciones a la opinión pública que pongan en riesgo los intereses comunales y el desarrollo del proyecto.
9. Mantenerse al margen de los asuntos políticos de las comunidades y del gobierno estatal y federal.
10. No buscar los propósitos de lucro en ninguna de sus formas.
11. Respetar los programas gubernamentales del estado y la federación, reservándose el derecho de participar en ellos sólo si existe una decisión acordada con las comunidades.
12. Presentar los resultados del proyecto a las comunidades, a las instancias normativas del estado y a las instituciones académicas.

#### **FUNCIONES Y RESPONSABILIDADES DE LAS PARTICIPANTES DURANTE LA PLANEACIÓN DEL PROYECTO**

##### **✓ EL MUNICIPIO DE SAN MIGUEL CHIMALAPA**

- Participar en el proceso de la planeación del proyecto e informar a la gente sobre la propuesta y las actividades de planeación.
- Coordinar las actividades de planeación entre el Municipio, las congregaciones y el equipo técnico; convocar a reuniones y talleres cuando sea necesario.
- Revisar documentos y hacer comentarios y sugerencias sobre la elaboración de la propuesta y los materiales de difusión y educación.
- Aportar al equipo técnico, siempre y cuando las condiciones lo permitan, apoyo logístico y operativo como respaldo para el trabajo con las comunidades, por ejemplo, alojamiento en la comunidad y acompañamiento en el campo.
- Apoyar con la difusión de información de las actividades y resultados a la gente en las comunidades e instituciones participantes.

*Acuerdo para la Planeación y Colaboración sobre el proyecto: Evaluación de los Impactos Ecológicos de los Incendios de 1998 y Desarrollo de Proyectos Comunitario Piloto en San Miguel Chimalapa, Oaxaca; 4 de noviembre, 2000.*

**LAS COMUNIDADES PILOTO DE SAN MIGUEL CHIMALAPA**

- **Los Limones**
- **Benito Juárez**
- **San Antonio**
- **Las Conchas**

- Elegir a través de la asamblea y de acuerdo a un perfil establecido un equipo comunitario de 2 personas quienes serán los responsables de la participación de la comunidad en la planeación del proyecto, y llevarán junto con el equipo técnico el intercambio continuo de información entre las actividades del proyecto y su comunidad.
- Participar en talleres comunitarios, revisión de materiales ilustrados, y otras actividades de capacitación los cuales serán organizados como parte del proceso de planeación e implementación del proyecto.
- Aportar al equipo técnico, siempre y cuando las condiciones lo permitan, apoyo logístico y operativo como respaldo para el trabajo con las comunidades, por ejemplo, alojamiento en la comunidad y acompañamiento en el campo.
- Apoyar con la difusión de información de las actividades y resultados a la gente en la comunidad e instituciones participantes durante el proceso de planeación.
- Participar en la implementación y administración de los proyectos comunitarios.

**✓ LAS INSTITUCIONES DE INVESTIGACIÓN**

- **Instituto Tecnológico Agropecuario de Oaxaca (ITAO)**
- **Universidad de Iowa de Ciencia y Tecnología (ISU)**
- **Instituto de Estudios sobre Desarrollo, Universidad de Sussex (IDS)**
- **Universidad de Agricultura de Suecia (SLU)**

- Desarrollar una metodología que permita estudiar, evaluar y monitorear los impactos ecológicos de los incendios sobre los bosques, y mediante la cual se incluya la participación comunitaria para éstas evaluaciones.
- Participar junto con los colaboradores locales de la comunidad en los trabajos de campo para realizar los estudios ecológicos.
- Colaborar en la planeación e implementación de algunos proyectos comunitarios piloto apoyando con la capacitación técnica y organizativa para estos proyectos y con la elaboración de propuestas.
- Difundir de manera constante las actividades y resultados del proyecto a las comunidades e instituciones participantes.
- Facilitar el acceso a documentos sobre estudios, proyectos, u otros trabajos ya realizados o en el proceso de implementación, que tengan relevancia para Los Chimalapas.

✓ **INSTITUCIONES DE ENLACE**

- **El Instituto Estatal de Ecología de Oaxaca (IEEO)**
  - **La Secretaría de Medio Ambiente, Recursos Naturales, y Pesca (SEMARNAP)**
  - **El Fondo Mundial – Programa Oaxaca (WWF-Oax.)**
- Facilitar el proceso de la planeación del proyecto a través de apoyo con las relaciones inter-institucionales en el nivel comunitario, estatal, y federal.
  - Facilitar el trabajo del campo con apoyo logístico, siempre y cuando las condiciones lo permitan, por ejemplo, con transporte, acompañamiento, y difusión de la información.
  - Facilitar el acceso a documentos sobre estudios, proyectos, u otros trabajos ya realizados o en el proceso de implementación los cuales tienen relevancia para Los Chimalapas.
  - Responder a preguntas que surgen sobre asuntos políticos, los cuales están bajo la responsabilidad de las instituciones y proveer de los documentos oficiales y comunicados de presentación y aclaración cuando sea necesario para facilitar los trabajos del proyecto.
  - Responder de una manera constructiva a las propuestas comunitarias sin modificar los acuerdos de trabajo acordados por las comunidades y el equipo técnico.
  - Presentar información de los trabajos solamente después de que ésta sea de orden público o exista el consentimiento previo de las comunidades y el equipo técnico.

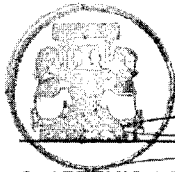
**COLABORADORES TÉCNICOS**

Los responsables de las instituciones serán los encargados de solicitar el apoyo técnico de la gente capacitada para realizar los distintos trabajos especializados que requieran durante el desarrollo del proyecto. También se asegurarán que dichas personas respeten este Convenio en todas sus partes.

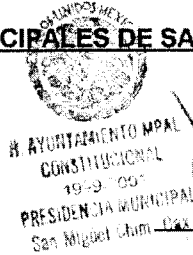
**ESTRATEGIA PARA EL FINANCIAMIENTO FUTURO**

Dado que el trabajo preparatorio de enero-septiembre 2000 todavía no ha concluido en una propuesta completa de trabajo entre las comunidades y el equipo técnico, se está buscando en este momento obtener un pequeño apoyo financiero adicional para el seguimiento de la fase preparatoria de este proyecto y para empezar algunos trabajos comunitarios y de investigación. Si se consigue este apoyo, estas actividades serán realizadas durante los meses enero a agosto de 2001. El objetivo central de esta nueva fase preparatoria será desarrollar una propuesta financiera junto con el municipio y las comunidades participantes para un proyecto a más largo tiempo (3-5 años), y considerando los objetivos y las formas de trabajo arriba mencionados.

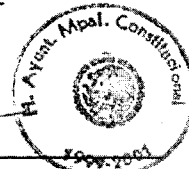
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**RESPONSABLES DEL MUNICIPIO Y LAS COMUNIDADES****LAS AUTORIDADES MUNICIPALES DE SAN MIGUEL CHIMALAPA**

**C. MARTEMIO AGUILAR JUAN**  
**COMISARIO DE BIENES COMUNALES**  
 SAN MIGUEL  
 CHIMALAPA, OAX.  
 2000-2001



**C. FAUSTO JIMÉNEZ REYES**  
**PRESIDENTE MUNICIPAL**



**C. RUFINO SÁNCHEZ MORALES**  
**SECRETARIO DE BIENES COMUNALES**

**C. BULMARO SOLANO**  
**REGIDOR DE ECOLOGÍA**

Regiduría de Ecología  
 Mpio. San Miguel  
 Chimalapa  
 Juchitán, Oax.

**LOS LIMONES**

**C. BULMARO SOLANO CRUZ**  
**SECRETARIO AUXILIAR**



**C. CRISÓFORO GUTIÉRREZ MORALES**  
**AGENCIA MUNICIPAL**  
**C. ROLANDO GARCÍA**  
 Mpio. San Miguel Chimalapa, Oax.

**C. JOSÉ ALFREDO MARTÍNEZ GARCÍA**  
**EQUIPO COMUNITARIO**

**C. ROSENDO DOLORES GARCÍA**  
**EQUIPO COMUNITARIO**

Acuerdo para la Planeación y Colaboración sobre el proyecto: Evaluación de los Impactos Ecológicos de los Incendios de 1998 y Desarrollo de Proyectos Comunitario Piloto en San Miguel Chimalapa, Oaxaca; 4 de noviembre, 2000.

**BENITO JUÁREZ**

  
C. MARTÍN SOLANO JIMÉNEZ  
SECRETARIO AUXILIAR

SECRETARÍA AUXILIAR  
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AGENCIA DE POLICIA MUNICIPAL  
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C. SIMEI SOLANO JIMÉNEZ  
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C. CARMELO CRUZ RAMÍREZ  
EQUIPO COMUNITARIO

**SAN ANTONIO**

  
EMILIANO PÉREZ GUTIÉRREZ  
SECRETARIO AUXILIAR DE B.C.

  
ALFONSO GUTIÉRREZ GARCÍA  
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AGENCIA DE POLICIA  
CORONA SECCION  
SAN ANTONIO, MPIO.  
SAN MIGUEL  
CHIMALAPA, OAX.

  
C. RAMIRO PÉREZ HERNÁNDEZ  
EQUIPO COMUNITARIO

  
JOSE LUIS RAMÍREZ MÁRQUEZ  
SECRETARIO DEL AGENTE DE POLICIA Y  
EQUIPO COMUNITARIO

**LAS CONCHAS**

  
C. FELIPE JIMÉNEZ MIGUEL  
SECRETARIO AUXILIAR

SECRETARÍA AUXILIAR DE BIENES COMUNALES  
LAS CONCHAS  
M. Miguel Chimalapa, Oax.

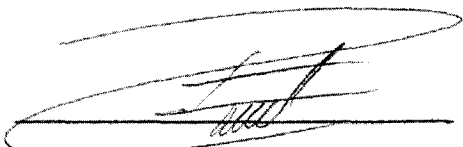
  
ALEJANDRO SOLANO PÉREZ  
AGENCIA MUNICIPAL

AGENCIA MPAL. COM. LAS CONCHAS  
M. MIGUEL CHIMALAPA  
OAXACA

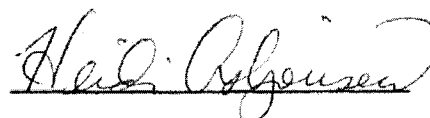
  
C. LUCIO SÁNCHEZ SÁNCHEZ  
VOCAL DE PROCAMPO Y EQUIPO COMUNITARIO

  
DOMINGO SOLANO PÉREZ  
SECRETARIO MUNICIPAL

Acuerdo para la Planeación y Colaboración sobre el proyecto: Evaluación de los Impactos Ecológicos de los Incendios de 1998 y Desarrollo de Proyectos Comunitario Piloto en San Miguel Chimalapa, Oaxaca; 4 de noviembre, 2000.

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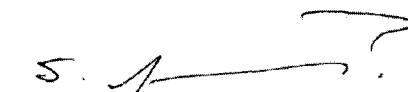


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WWF-PROGRAMA OAXACA  
TEL: 01-951-36735

ING. FELIX G. PINEIRO M.  
DIRECTOR DE DESARROLLO FORESTAL Y FAUNA

LIC. ARMANDO VÁSQUEZ GUZMÁN  
RESIDENTE DE LA PROCURADURÍA AGRARIA  
EN MATIAS ROMERO

**APPENDIX 5. GIEMPBI TIMELINE AND IMPACT ON COMMUNITY CAPITALS**

<b>Time Period</b>	<b>Activities</b>	<b>Capitals impacted</b>
<b>Phase I. Project Planning (2000)</b>		
<b>January</b>	Visits to San Miguel and Santa Maria Chimalapas and meetings with linking institutions (SEMARNAP, IEEO, WWF, SERBO) and community authorities	<b>Social, Political</b>
<b>June</b>	Project presentation to San Miguel Chimalapa authorities (municipal and villages). Selection of four pilot communities (Los Limones, Las Conchas, Benito Juárez and San Antonio). Inclusion of productive projects within global project.	<b>Social, Political, Cultural, Human, Natural, Financial</b>
<b>July</b>	Presentation of proposal within San Miguel Chimalapa villages	<b>Social</b>
<b>October-November</b>	Participation in community assemblies and selection of committees in four pilot communities	<b>Social, Human, Cultural, Political</b>
<b>Phase II. Global Project Planning (2001)</b>		
<b>January</b>	Meeting with committees and authorities (municipal and communal). Identification of community productive projects.	<b>Social, Political, Cultural, Human, Natural, Financial</b>
<b>February-March</b>	Planning workshops for productive projects and community organizational capacities. Assembly acts accepting community productive projects. Selection of field plots for ecological research	<b>Social, Political, Cultural, Human, Natural, Financial</b>
<b>April-May</b>	MoU	<b>Social, Political</b>
<b>July</b>	Meetings between stakeholders	<b>Social, Political</b>
<b>October</b>	Visit of Mexican partners to Iowa State University. Integration of ecological, productive and social components of the project. Development of GEF project.	<b>Social, Political, Cultural, Human, Natural, Financial</b>
<b>Phase III. Post Planning/ Implementation Period (2002)</b>		
<b>January</b>	Development and distribution of an informative handout on project activities. Visit of social research team from ISU with communities and municipal authorities	<b>Natural, Social, Human, Political</b>
<b>April- June</b>	Ecological project field work (PROCYMAF) with two of the pilot communities (Benito Juarez and San Antonio)	<b>Natural, Human, Social, Political, Cultural, Financial</b>
<b>May</b>	Sociology PhD. Student visits communities and main stakeholders to start a PAR within Chimalapas GIEMPBI project Community capacity building workshops (forestry nurseries). Ecological report to Oaxacan agencies.	<b>Social, Human, Political, Cultural, Financial, Natural</b>
<b>December</b>	First year report of activities to PROCYMAF. Development of proposals to get funds (PROCYMAF, CONAFOR, FMCN, NSF, AID)	<b>Natural. Social, Financial</b>



**APPENDIX 5. (Continued)**

<b>Time Period</b>	<b>Activities</b>	<b>Capitals Impacted</b>
<b>Phase III. Post Planning/ Implementation Period (2003)</b>		
<b>January</b>	Participatory evaluation workshop (Benito Juarez, San Antonio), presentation of evaluation to municipal authorities and state agencies and organizations. Participation of ASPRO in irrigation systems field demonstrations	<b>Social, Political, Built</b>
<b>March</b>	Visit of ISU sustainable livelihoods initiative to explore joint possibilities. Visit from SLU student (soil study)	<b>Social, Financial, Natural</b>
<b>May-June</b>	Negotiation to maintain ecological research within Benito Juarez and San Antonio. Interviews to conduct a participatory systematization of the experience	<b>Social, Political, Human, Natural</b>
<b>October</b>	Community capacity building course on ecological assessment of fire affected cloud forests and application of knowledge to community based initiatives. Preliminary results of systematization presented in II international biodiversity symposium	<b>Social, Human, Cultural, Natural</b>
<b>October-December</b>	Continuation of ecological research	<b>Natural</b>
<b>Phase III. Post Planning/ Implementation Period (2004)</b>		
<b>January</b>	Visit of ISU researchers to different agencies/partners to strengthen relationships and search for funding opportunities. Presentation of ISU graduate students to different stakeholders	<b>Social, Political, Financial</b>
<b>March</b>	Presentation of ecological results to the communities, authorities and partner agencies. Focus group with community ecological committee to evaluate project	<b>Social, Political, Human, Natural</b>
<b>May</b>	Principal investigator of GIEMPBI along with ISU students travel to Oaxaca to start PAR. Participation within Chimalapas Master Plan meetings. Meetings in Oaxaca with project partners and participation in community assemblies to get permission for students' research. Denial of permission to conduct any research during summer 2004.	<b>Social, Political, Human, Natural</b>
<b>June</b>	Letter from municipal authorities to GIEMPBI explaining fragile situation within the communities (agrarian situation aggravated by political uncertainty). Demands from communities and Chimalapas' Master plan leaders to have GIEMPBI active participation within the master plan meetings.	<b>Social, Political</b>
<b>July</b>	Visit from ISU sociologist to help in the institutional negotiation with partners and advice ISU grad students. Two ISU graduate students changing research site and two students changing the approach from participatory to theoretical analysis.	<b>Human, Social, Political</b>
<b>August</b>	ISU graduate students return to Iowa and start proposals for research. Presentation of ecological research in scientific events	<b>Human, Natural</b>
<b>October</b>	Presentation of ecological research in scientific events	<b>Human, Natural</b>
<b>November-December</b>	Presentation of ecological and sociological research in scientific events	<b>Human, Social, Natural</b>

**APPENDIX 6. LETTER FROM SAN MIGUEL CHIMALAPAS JUSTIFYING THE  
DENIAL OF PERMISSION TO CONDUCT RESEARCH DURING SUMMER 2004**

Recibi 14/06/0  
15:07

ASUNTO: AVISO GENERAL  
DEPENDENCIA: COMISARIADO DE BIENES  
COMUNALES.  
FECHA: 5 DE MAYO DEL 2004.

C. Dr. SALVADOR LOZANO TREJO.  
DIRECTOR DEL INSTITUTO TECNOLÓGICO  
AGROPECUARIO DE OAXACA.  
ITAO.  
PRESENTE.

POR ESTE MEDIO LOS QUE SUSCRIBIMOS LAS AUTORIDADES  
COMUNALES DE ESTE MUNICIPIO DE SAN MIGUEL CHIMALAPAS NOS  
DIRIGIMOS A USTED POR MOTIVO DE LA SIGUIENTE CUESTIÓN.

DADO ALA GRAVEDAD DE LA PROBLEMÁTICA AGRARIA DEL MOMENTO  
SUSCITADO EN LA ZONA ORIENTE CON EL MUNICIPIO DE ZANATEPEC  
OAXACA Y EL ESTADO DE CHIAPAS, SUSPENDAMOS POR EL MOMENTO  
TODO TIPO DE INTERÉS DE INVESTIGACIÓN ACADÉMICA Y CIENTÍFICA  
QUE LA INSTITUCIÓN QUE USTED PRESIDE CON RELACIÓN A LA  
UNIVERSIDAD ESTATAL DE IOWA PARA NUESTRA REGIÓN, POR TAL  
MOTIVO LES SOLICITAMOS QUE SE SOLIDARICE ENVIANDO UNA MISIVA  
A LA PRESIDENCIA DE LA REPUBLICA, PARA LA SOLUCIÓN DEL  
CONFLICTO AGRARIO, LA CUAL EL PRESIDENTE SE HA COMPROMETIDO  
A APAGAR EL FOCO ROJO EN LA REGIÓN Y POR SEGURIDAD DE SU  
PERSONAL REITERAMOS EL INICIO DE SUS ACTIVIDADES HASTA QUE SE  
RESUELVA EL CONFLICTO.

ESPERAMOS SU COMPRENSIÓN Y LE ANTICIPAMOS LAS GRACIAS  
ENVIANDO UN FRATERNAL SALUDO DE SUS AMIGOS LOS CHIMA LAPAS.



PRESIDENCIA DE LA  
COMISARIA DE  
BIENES COMUNALES  
SAN MIGUEL CHIMALAPA, OAX  
1 2003-2006

AMOR ANTONIO CRUZ.  
SECRETARIO.

ATENTAMENTE.

CUAUHTEMOC MARTÍNEZ GUTIÉRREZ.  
PRESIDENTE DE BIENES COMUNALES.

ESTEVAN SÁNCHEZ VÁSQUEZ.  
TESORERO.

# COMISARIADO DE BIENES COMUNALES

## SAN MIGUEL CHIMALAPA, JUCH., OAX.

2003 - 2006

PRESIDENTE

C. PROF. CUAUTEMOC MARTÍNEZ GIL

SECRETARIO

C. ANTONIO CRUZ

TESORERO

C. ESTEBAN SANCHEZ VASQUEZ

CONSEJO DE VIGILANCIA

C. PROF. DOMINGO SALINO PEREZ

### ACTA DE INVESTIGACION

En la Congregación de Cinco de Noviembre, Municipio de San Miguel Chimalapa, Distrito de Juchitán, Estado de Oaxaca, siendo las dieciséis horas del día nueve de junio del 2004, reunidos los CC. Cuauhtemoc Martínez Gutiérrez, José Alfredo Jiménez Cruz, Ramiro Maya Vázquez, Moisés Martínez Solano, Antonino Sánchez Solano, Joaquín García García, Comisariado de Bienes Comunales, Presidente Municipal Constitucional, Secretario Auxiliar de Benito Juárez, Secretario Auxiliar de San Antonio, Jefe de Sección Municipal y Secretario Auxiliar de Sol y Luna, y comuneros del municipio de San Miguel Chimalapa. Todos con la finalidad de llevar a cabo la investigación de las anomalías y atropellos que realizó un grupo de individuos comandados por la señora Adelma Núñez y Rafael Cacique, y los Comisariados Ejidal y Comunal y supuestos propietarios de la vecina población de Zanatepec, Oaxaca, a continuación se especifican.

1. En el punto arroyo pando verificamos que se interrumpió el acceso del camino que conduce a la comunidad de Cinco de Noviembre, encontrándose una excavación de 3X2 mts. Con una profundidad de 1.50 mts.
2. En la carretera que conduce del Jicaro, Pascual Fuentes, a las comunidades de Sol y Luna, San Antonio y Benito Juárez Chimalapa, se interrumpió el acceso de este camino con una excavación de 6x3 mts. Con una profundidad de 2 mts, en esta investigación nos acompañó el comandante David Reyes Barragán con cinco elementos preventivos y una patrulla de Num. 742. como medida de seguridad.

Ante este hecho demandamos enérgicamente las acciones de violencia y atropellos que vienen realizando estos señores en contra de los comuneros de estas comunidades de la Zona Oriente de San Miguel Chimalapa, Oaxaca.

En razón a estos hechos solicitamos la intervención de las Autoridades del Gobierno Estatal y Federal, con el objeto de evitar un enfrentamiento entre ambas comunidades, ya que estos se encuentran incomunicados de tal modo, denunciemos enérgicamente a Adelma Núñez y su esposo Rafael Cacique, como responsables de todos estos actos y dejamos claro que todo lo que suceda será su propia responsabilidad.

No habiendo otro asunto que tratar se cierra la presente siendo las dieciocho horas del mismo día de su inicio, firmando al calce los que en ella intervinieron.

DAMOS...FE-----

# COMISARIADO DE BIENES COMUNALES

SAN MIGUEL CHIMALAPA, JUCH, OAX.

2003 - 2006

COMUNEROS PARTICIPANTES EN LA  
INVESTIGACION DEL MUNICIPIO DE SAN  
MIGUEL CHIMALAPA, OAX.

PRESIDENTE

C. PROF. CEAUTEMOC MARTINEZ GTZ.

SECRETARIO

C. AMOS ANTONIO CRUZ

TESORERO

C. ESTEBAN NANCHEZ VASQUEZ

CONSEJO DE VIGILANCIA

C. PROF. DOMINGO SOLANO PEREZ

C. DOMINGO JIMENEZ JIMENEZ

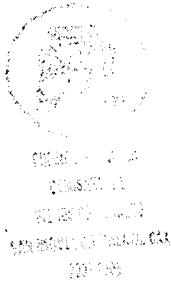
C. ANGELICO SOLANO JIMENEZ

C. SANTIAGO GARCIA MORALES

C. RENE CARLOS MURILLO YOVAL

C. REYNAL SOLIS MARTINEZ

C. ELIAS GARCIA SANCHEZ



# COMISARIADO DE BIENES COMUNALES

SAN MIGUEL CHIMALAPA, JUCH, OAX.

2003 - 2006

PRESIDENTE  
C. PROF. CUAUTEMOC MARTINEZ GTZ.

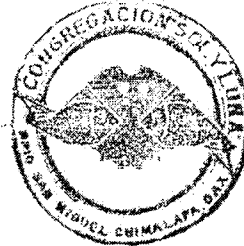
SECRETARIO  
C. AMOS ANTONIO CRUZ

TESORERO  
C. ESTEBAN SANCHEZ VASQUEZ

CONSEJO DE VIGILANCIA  
C. PROF. DOMINGO SOLANO PEREZ

JOSQUIN GARCIA GARCIA.

SECRETARIO AUXILIAR DE S.C.  
SOL Y LUNA

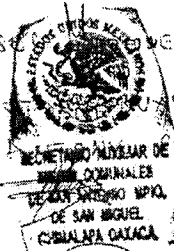


ANTONINO LINCHEZ SOLANO  
JEFE DE SECCION MUNICIPAL  
SOL Y LUNA



San Miguel Chimalapa  
Iuchitán, Oaxaca

MOISE...  
SECRETARIO AUXILIAR DE S.C.  
SECRETARIO MUNICIPAL DE BIENES COMUNALES  
DE SAN MIGUEL CHIMALAPA  
OAXACA



RAIRO MAYA VAZQUEZ  
SECRETARIO AUXILIAR  
BENITO JUAREZ CHIM.



AYUNTAMIENTO  
SAN MIGUEL CHIMALAPA  
OAXACA

CUAUTEMOC MARTINEZ GTZ.

PRESIDENTE DE BIENES COMUNALES

JOSE ALFREDO JIMENEZ CRUZ  
PRESIDENTE MUNICIPAL.  
San Miguel Chimalapa,  
Iuchitán, Oax.  
2003 - 2006

**APPENDIX 7. COPY OF AN ELEMENTARY SCHOOL BOOK TO TEACH ZOQUE  
LANGUAGE**

# Bin angmaykuy toto angpønjo'

*Lengua Zoque de San Miguel  
Chimalapa, Oaxaca*

*Primer ciclo*

*Parte I*





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### **THANK YOU- THANK YOU**

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